

Western industry



FEBRUARY 1960



featuring: **NEW DEVELOPMENT IN
SHELL CASTING FIELD**

special: **SELECTING YOUR WESTERN PLANT SITE
LATEST TECHNICAL LITERATURE ON ABRASIVES**

WHAT'S YOUR STEEL PROBLEM?

When you need help in steel selection or processing, the man from Jorgensen is at your service... backed by a staff of metallurgical engineers available to work directly with you.

He's at your service, too, with vast stocks of steel in an endless variety of analyses, shapes, and sizes... complete cutting facilities... and immediate delivery by Jorgensen's own fast fleet of trucks.

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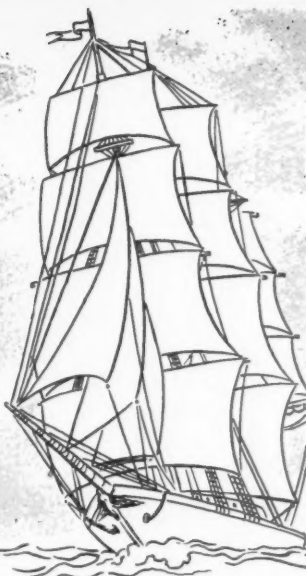


EARLE M. JORGENSEN CO.
STEEL

LOS ANGELES • SAN DIEGO • PHOENIX • OAKLAND • SAN FRANCISCO • SEATTLE • HOUSTON • DALLAS • TULSA • DENVER • WICHITA

Why Rust-Oleum is different—

and what this difference,
backed by 35 years of industry proof,
means to you!



A Sea Captain
developed it . . .
Industry
proved it!

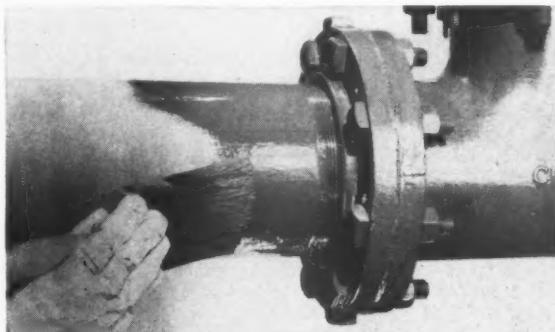
The original Rust-Oleum formula was developed nearly fifty years ago by Sea Captain Robert Fergusson, who became intrigued with the rust-stopping qualities of fish oil early in his career. Creating a special treatment for the fish oil, he used the specially-processed fish oil as the vehicle in combination with fine rust-inhibiting pigments. The result? A coating that actually stopped rust when applied directly over sound rusted surfaces, after scraping and wirebrushing to remove rust scale and loose rust. Possible, because the specially-processed fish oil penetrated the rust to bare metal. This was the birth of Rust-Oleum's exclusive 769 Damp-Proof Red Primer.

PROVED THROUGHOUT INDUSTRY FOR OVER 35 YEARS

Today, Rust-Oleum in its many systems and colors, has been proved throughout industry for over thirty-five years. This proof by leading industrial users is your assurance of savings in time, money, and metal. Economies made possible by the fact that Rust-Oleum 769 Damp-Proof Red Primer goes right over the sound rusted metal—usually eliminating costly surface preparations. And Rust-Oleum, in its various systems, resists rain, sun, fumes, heat, weathering, chemicals, etc., for lasting beauty over the years.

RUST-OLEUM NEW COLOR HORIZONS SYSTEM

The Rust-Oleum New Color Horizons System introduces a new coating concept to industry. It combines four important factors: (1) the ability to stop rust, (2) smart, modern color harmony, (3) the durability to last and last, (4) ease of application that saves time, money, and metal. See how this system can bring lasting beauty to your plant, machinery, equipment, pipes, tanks, structural steel, fences, etc. Write for complete information or contact your nearby Rust-Oleum Industrial Distributor. He maintains complete stocks for prompt service.



RUST-OLEUM®



There are imitations,
but only one Rust-Oleum.
It is distinctive as
your own fingerprint.

STOPS RUST!

ATTACH TO YOUR LETTERHEAD

Rust-Oleum Corporation
2527 Oakton St., Evanston, Illinois

Please send me the following at no cost or obligation:

- ☐ New Color Horizons Systems Catalog featuring 110 actual color standards and 69 photo applications.
- ☐ Free test sample of Rust-Oleum 769 Damp-Proof Red Primer to be applied over sound rusted surface.
- ☐ Results of radioactive tracing study on Rust-Oleum fish oil penetration.

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WESTERN INDUSTRY/FEBRUARY 1960

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FEBRUARY-1960

Vol. 25

No. 2

western
industry



SERVES THE THIRTEEN WESTERN STATES

SPECIAL REPORT	21	<i>How to select your Western plant site</i>
	64	<i>Special manuals on abrasives</i>
METALS (cover story)	29	<i>New development in shell casting field</i>
	46	<i>Hardcoating aluminum saves weight and cost</i>
COMMUNICATIONS	32	<i>Communications system for fast production control</i>
MATERIAL HANDLING	31	<i>Steel conveyor moves hot materials</i>
	44	<i>Palletized delivery for bagged cement</i>
	46	<i>Clever racks for aluminum products</i>
MANAGEMENT	34	<i>Engineering changes, new system cuts their cost</i>
	39	<i>Los Angeles in 1960, future industrial growth</i>
DESIGN	41	<i>Unusual coating cuts underwater drag</i>
PRODUCTION	34	<i>Mechanized welding increases production speed</i>
	37	<i>Paint system handles 12,000 units daily</i>
	50	<i>Steel honeycomb brazed with graphite cloth</i>
MAINTENANCE	52	<i>Scrap container cuts chip disposal time</i>
PACKAGING	48	<i>Metal containers assembled by adhesives</i>
COVER PHOTO		<i>Vail area of Los Angeles' Central Mfg. District seen from air. Area comprises some 400 acres suitable for plant site development.</i>
DEPARTMENTS	12	WESTERN MEETING REPORTS
	54	HELPFUL LITERATURE
	56	ADVERTISED LITERATURE
	68	NEW EQUIPMENT
	81	WESTERN INDUSTRY NEWS
	98	WESTERNERS AT WORK
	102	INDEX TO ADVERTISERS

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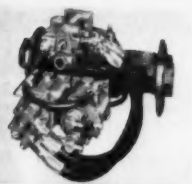
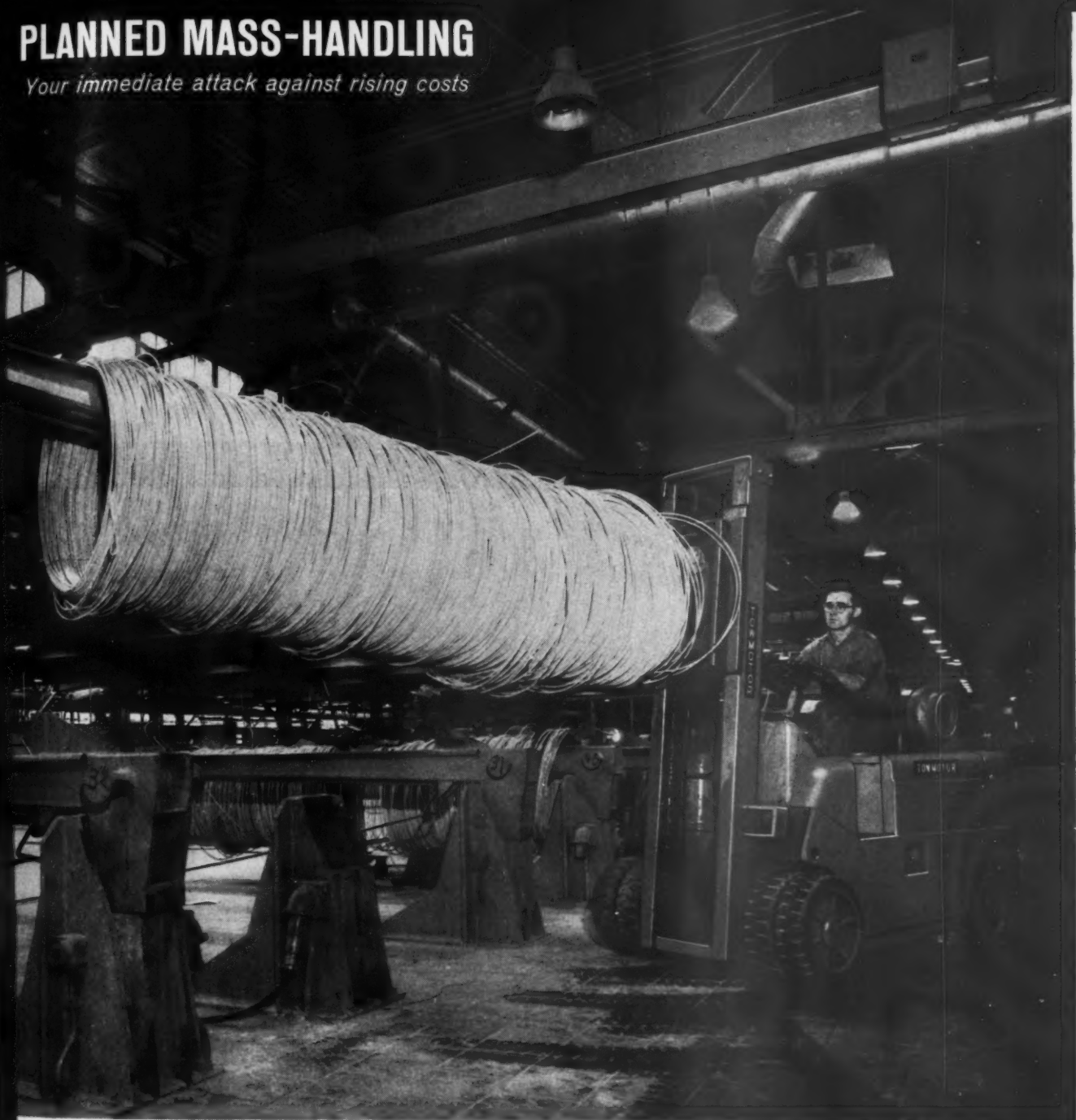
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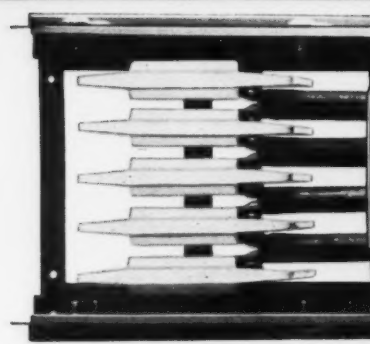
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Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

INTRODUCING NEW

The safest,
fastest-to-install
plug-in
duct ever
designed!



Now BullDog, the originators of Bus Duct systems, gives you a new safety for plant personnel plus new installation speed and economy with new XL BUStribution duct! Completely But covered aluminum bus bars give true dead-front construction. Crews can now install more duct in a day than ever before. Superior engineering provides low voltage drop . . . down to half that of other plug-in duct systems . . . plus unexcelled short circuit rating. BullDog gives you completely engineered fittings. You can get everything you need from a single source—your local BullDog distributor. Call him—he'll give you a demonstration of all the XL safety and installation features.

FAST INSTALLATION

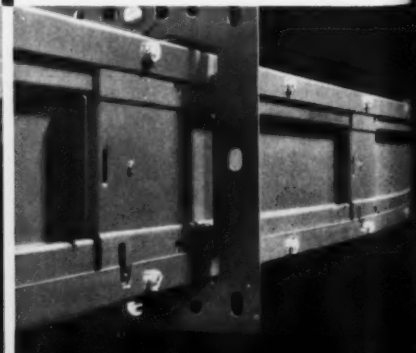
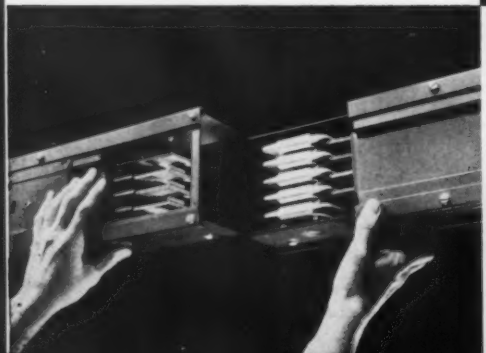
Keyed bus ends align themselves positively, instantly, without fumbling or wasted time. You can position sections as fast as you can handle them!

EASY INSTALLATION

This one integral bolt locks POSITIVELY . . . holds keyed bus ends under a ton of pressure. The fully insulated bolt spins tight fast. Joints stay locked!

ECONOMICAL INSTALLATION

You need only half as many hangers as usual. Ten-foot supporting spans cut number of hangers and the time needed to install them by 50%.



BULLDOG

XL

BUStrubution®
DUCT



The new XL SAFETY-PLUG is faster, safer to use than any other plug!

XL Safety-Plug has new, simplified design. You can plug-in on XL duct in seconds. It has safety features not found on any other plug. Plugs are available which prevent installation or removal when plug handle is in the "on" position. You can plug in from either side of the duct, in all duct sizes from 225 through 1000 amps. You can use all plug-in openings at the same time, if desired.

When you see your Bulldog distributor about XL duct, examine the Safety-Plug he has on display, too. Here's an electrical team you can depend on to do the job better in every way!

Consult the following Pacific Coast representatives:



BULLDOG ELECTRIC PRODUCTS DIVISION
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BOX 177 • DETROIT 32, MICHIGAN

In Canada: 80 Clayson Rd., Toronto 15, Ont. Export Division: 13 East 40th St., New York 16, N.Y.

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Young Electric & Mfg. Co.
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Safety Switchboard Company
910-89th Avenue
Oakland 21, California

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2885 E. Washington Blvd.
Los Angeles 23, California

DEAD-FRONT SAFETY

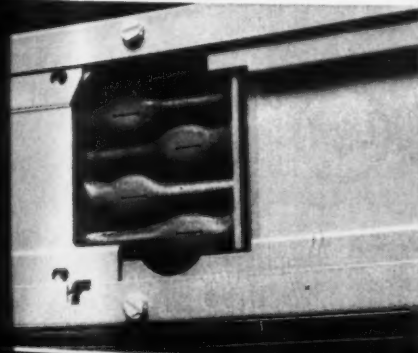
Each bus bar has full-length Butyl insulation, even in bus plug openings. XL BUStrubution Duct is the world's safest duct to plug into, to work around.

PERSONNEL SAFETY

Safety door covers the opening . . . slides back when safety interlock finger is in position. Plug cannot be removed or installed when safety door is open.

EQUIPMENT SAFETY

SAFETY PLUGS cannot be installed or removed when in the "on" position . . . exclusive design positively protects against arcing, safeguards equipment.



New Western ideas in steel

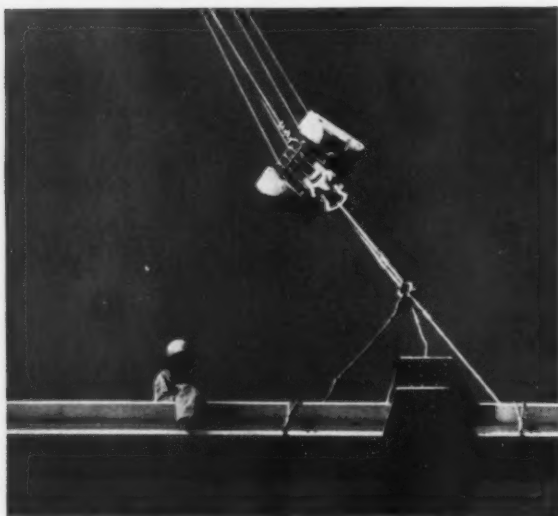
USS, COR-TEN, AND TIGER BRAND ARE REGISTERED TRADEMARKS



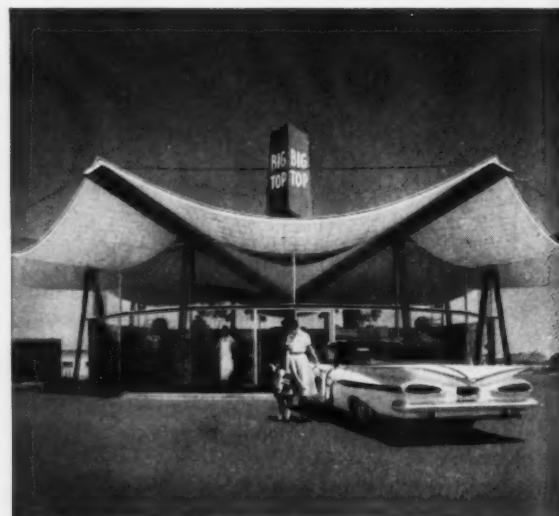
Serving Up Monsters on Steel Platters is routine for Wilhelm Trucking Company, Portland, Ore. This 152-ton chunk of machinery rides a trailer made by Peerless Trailer and Truck Co., Portland. Its backbone is USS Cor-Ten Steel, famous for strength in tough Western jobs.



Taking a Short-cut on a Floating "Road" saves Lorenz Lumber Co., Burney, Calif., 17 miles of mountain hauling. This husky ferry barge, built by Medford Steel Co., handles giant log loads easily—with USS Plate and Structural Steel to give it rugged durability.



Helping Lace a Lofty Bridge Together is a job for steely nerves—and reliable wire rope. On the recently opened Carquinez parallel crossing, one of California's newest bridges, the heavy work hung on USS Tiger Brand Wire Rope—Western construction man's favorite.



No Standing in Line in This Grocery! It's the drive-in Big-Top Store of Denver, Colo., where a spacious octagonal steel building means attractive merchandising, quick service. Fabricated by Denver Steel & Iron Works, Big-Top features USS Steels in its unusual design.

Lightens your work
Brightens your leisure
Widens your world



Keeping pace with Western business and industrial growth, USS is the West's only source of steel for every product and project. Keen Western purchasing agents depend on USS for quality, strength and durability—plus expert metallurgical help. Call any United States Steel representative for immediate action.

STEEL FOR EVERY PURPOSE FROM A SINGLE SOURCE



**Columbia-Geneva Steel
Division of
United States Steel**

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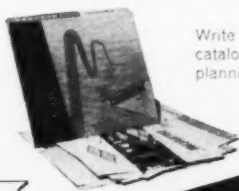
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Power & Free Chainveyor System Eliminates Unnecessary Manual Handling



This overhead power and free conveyor system transports loaded carriers through multiple automatic switch stations. The carriers move into any one of a number of free (non-powered) lines for in-process storage according to grade and color of the load. Power is provided by a standard Chainveyor system on which pusher dogs are mounted directly to the enclosed chain. These dogs engage arms on the free track carriers. Switches automatically divert loads from power lines to gravity storage lines and back to power lines as desired.

Chainveyor's superior power and free design replaces bulk with ingenuity and versatility to solve critical production problems economically and efficiently. Investigate Chainveyor's advantages for modernization or new plant applications now!



Write for Chainveyor's Planning Folder which includes illustrated catalogs, explanatory diagrams, plant and conveyor planning grids for preliminary layouts.

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CONVEYOR
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they've got to be good!

Thirty years of experience in pressure-type
castings is your assurance of quality.

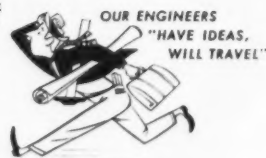
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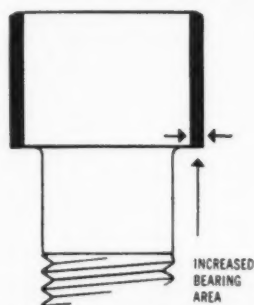


Up to 2 $\frac{1}{3}$ times as much holding power!

Up to 100% longer fatigue life!

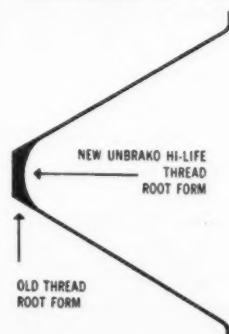
New UNBRAKO *pHd** Hi-Life socket screws increase mechanical reliability of your assemblies without increasing production costs

Stronger in the head



New pHd head features increased bearing area, more powerful wrenching socket; provides up to 2 $\frac{1}{3}$ times as much clamping force without indenting bolted material. This permits higher preloading, which in turn helps prevent fatigue failures or loosening under vibration.

Stronger in the thread



Smoothly radiused root of new Hi-Life thread distributes stress concentrations at point where 85% of screw failures occur, practically doubles fatigue life. New thread—exclusive with UNBRAKO—fits standard tapped holes and nuts, requires no special gaging or assembly techniques.



Here is the one new socket head cap screw that is redesigned throughout. UNBRAKO pHd Hi-Life is the only standard socket screw offering you both the new, larger pHd head (1960 Series) and new UNBRAKO Hi-Life thread.

Because of increased bearing area under the head, you can tighten a pHd Hi-Life tighter without indenting bolted material. This safeguards vital preload; protects against loosening under shock or vibration. At the same time, the new Hi-Life thread form drastically reduces stress concentrations at the root, where most screw failures occur. Result: up to 100% increase in fatigue life.

Both the pHd head and Hi-Life thread originated in the SPS laboratories for advanced fastener research where they were first developed for ultra-high-strength aircraft bolts. Recognizing the critical need for greater mechanical reliability in industrial and consumer goods as well, SPS now offers these refinements in a standard commercial fastener.

New UNBRAKO pHd Hi-Life socket screws are available to you immediately in sizes $\frac{1}{4}$ through 1 inch, plain or cadmium plated, with or without the Nylok† self-locking feature. They cost no more, require no change in assembly or gaging procedures. See your authorized UNBRAKO distributor or write SPS—manufacturer of precision threaded fasteners and allied products in many metals, including titanium. Request Bulletin 2406, 2577.

†T.M. Reg. U.S. Pat. Off., The Nylok Corp.

**TENSION-TENSION FATIGUE TESTS
PROVE LONGER FATIGUE LIFE OF
UNBRAKO HI-LIFE THREAD FORM**

Screw Size: $\frac{1}{2}$ -20 Testing Speed: 1050 cpm

Alternating Stress in psi (000 omitted)	Cycle Life	
	Old Thread Root Form	UNBRAKO Hi-Life Threads
2-20	2,076,000	8,000,000*
3-30	598,000	1,808,000
4-40	120,700	232,350
5-50	56,650	89,950
7-70	22,900	40,000

*Test stopped—no failure

INDUSTRIAL FASTENER Division

JENKINTOWN 47, PENNSYLVANIA

SPS

where reliability replaces probability

*pHd stands for "proper head design"—a factor in higher product reliability

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western
industry

**western
meetings**

Western Packaging & Materials Handling Exposition Scheduled for July 19-21

THE EIGHTH Western Packaging & Materials Handling Exposition will be held at the Pan Pacific Auditorium in Los Angeles, July 19-21. Nearly all exhibit space has been contracted for although the show date is a number of months away.

At a recent meeting with the Board of Sponsors of the Exposition, Saul Poliak, head of the firm, Clapp & Poliak, world's largest producers of trade expositions, stated, "All the traditional factors which create successful trade shows points to the West Coast and particularly California. The robust growth of the Western Packaging and Materials Handling Exposition is ready evidence of this."

1960 Western Joint Computer Conference

ALL EXHIBIT SPACE at the 1960 Western Joint Computer Conference in San Francisco on May 3-5 has been sold according to Harry K. Farrar, Exhibit Chairman. He reported to Robert M. Bennett, Jr., of IBM, General Chairman, that all 78 booth locations in the new Jack Tar Hotel, site of the conference, have been fully subscribed.

Farrar said, however, expressions of interest in exhibiting will continue to be received until April 1, in the event of booth cancellation. The exhibits will be on the same level and close by the California and International Rooms housing the technical sessions.

Investment Casters Meeting

AT A RECENT MEETING of the Investment Casters Society, principal speaker was Frank Romo, X-ray analyst from General Inspection Laboratories at Bell, California. Romo presented his talk in a manner which was highly interesting to the group, discussing the various technical phases of X-ray, including kinds of equipment and types of film. He then moved into a discussion and illustration of the actual operation in an X-ray plant and concluded his talk telling of the problems that the X-ray people have in getting standards and specifications from their customers and in turn from the major aircraft subcontractors.

The securing of adequate standards from the subcontractors prior to starting a job is one of the real problems of the investment casting industry. In the phases of quotation and preliminary engineering, this information is highly necessary and often not available. The new specifications, such as MIL-C-6021-D were brought out and discussed in detail in a question and answer period after the meeting.

Redwood Logging Conference

THE 22nd ANNUAL SESSION of the Redwood Region Logging Conference will be held at Eureka, California,

March 17-18. Program for the conference is under direction of Gene Pickett, Chairman of the Program Committee.

Program subjects include log trucking problems, handling and storage of logs, contract vs. company logging, timber sales, public and private, maintenance shop procedures, chain saw operation and maintenance, new techniques in fire control, and the effects of the coming pulp and paper industry.

Service Award Presented to Harvey Aluminum

THE SLIDING GLASS Door and Window Institute has presented a special award for technical service to Harvey Aluminum. The plaque given to Harvey in recognition of



A SPECIAL SERVICE AWARD recognizing the technical research report prepared by Harvey Aluminum for the Sliding Glass Door & Window Institute is presented by association president, Murrell Spence, at left, to Lawrence Harvey, executive vice president Harvey Aluminum, right.

the company's research and compilation of a specifications report for the technical committee of the national association. In the report, Harvey metallurgists documented finishes, surface treatment, test procedures, and other useful data pertaining to aluminum for sliding glass doors.

ASTME to Hold Three Technical Seminars on West Coast in March

THE AMERICAN SOCIETY of Tool and Manufacturing Engineers will hold three technical seminars on the West Coast in March. Subjects and papers have been especially selected to relate to problems of engineers in this area.

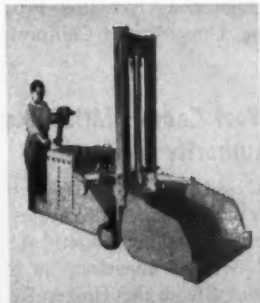
A "Workshop in Optical Tooling Methods in Manufacturing" March 1 and 2 at the Ambassador Hotel in Los Angeles, will give engineers an opportunity to participate in tooling problems and to discuss the many questions arising in the two-day program. Papers will lay the foundation for practical set-up and demonstrations of optical tooling methods.

On March 3 and 4 a "Metal Forming for Tomorrow's Manufacturing" Seminar is planned for the Ambassador Hotel in Los Angeles. Papers will give the latest and most important information concerning forming methods on new

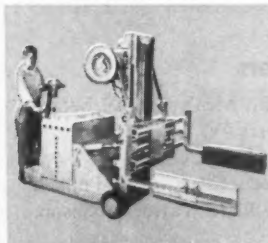
Look at all these things a *Transporter* can do!

Here are 8 cost-cutting ways Automatic's Standard Attachments can turn Transporters into Specialists

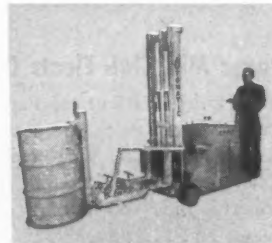
These specially designed standard attachments can add job flexibility to your Transporter Stackers. Now, a variety of jobs can be performed at considerable cost savings.



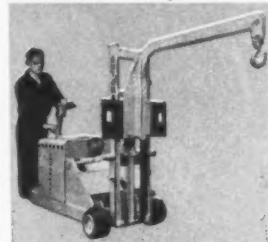
HYDRAULIC SCOOP...for handling loose materials can be furnished as a removable attachment.



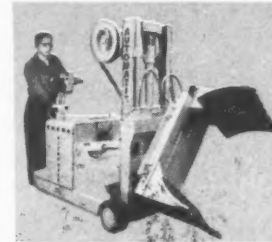
UTILITY CLAMPING DEVICE...Clamp arms can be attached to forks for handling cartons, etc. Clamp arms can be removed to handle pallets.



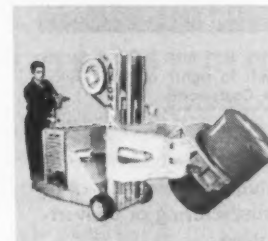
MECHANICAL GRAVITY DRUM DUMPER...Removable attachment to fit on forks.



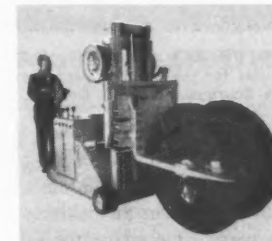
GOOSENECK CRANE ATTACHMENT...for items too bulky or too irregular in shape to be palletized.



REVOLVING PAPER ROLL CLAMP...handles rolls vertically or horizontally...revolves 360° right of left.



HYDRAULIC DRUM HANDLER...picks up and carries any standard drum...180° controlled forward dumping.

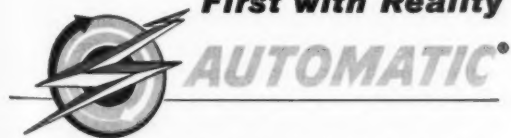


CABLE REEL HANDLER...lifts and transports wire and cable reels.

REMOTE CONTROL MAST permits operator to ride up and down for order picking or maintenance work by pushing button on carriage. Platform folds back to permit normal use of forks.

First in Imagination...

First with Reality



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MEETINGS

(continued)

materials; techniques covering impact process, explosives, high energy rates, power spinning and roll forming; producibility and material utilization; plus stampings, forging operations and ingot improvements.

"Some Problems of Machining Space Age Metals" will be discussed March 8 and 9 at the Sheraton-Palace Hotel in San Francisco. Papers on the superalloys and machining methods, such as electric discharge, electro-mechanical, chem-milling, electrolytic grinding and jet blasts, as well as developments in vacuum melted castings and powder metallurgy will be presented.

Paper Mill Club Elects Officers

NEW OFFICERS of the Paper Mill Men's Club of Southern California are: President, Harry W. Granger, Oregon Pulp & Paper Co., Vice-President, Jack Courtney, Crown-Zellerbach Corp., Secretary, Reuben Coatsworth, Potlatch Forests, Inc., and Treasurer, Williard Taylor, Johnson, Carvel and Murphy.



NEW OFFICERS of nationally known Paper Mill Men's Club discuss policies for the coming year. They are (left to right) Williard Taylor, Jack Courtney, Harry W. Granger, Reuben Coatsworth.

The club founded in 1934 has a present membership of approximately 170. Members include representatives of mills engaged in the business of manufacturing or converting paper or cordage for sale to jobbers.

Engineering Executive Program

APPLICATIONS FOR THE Engineering Executive Program, open to working engineers interested in future administrative responsibilities, are now being accepted by the University of California, Los Angeles.

The application deadline for the 1960 fall program is March 1. Classes will meet once a week in the afternoon and evening for two years, leading to a Master's degree in engineering for successful participants.

Two basic concepts underlie the University Extension program:

(1) America's complex industries need leaders with sound technological training. It is easier to make a top technical manager out of a trained engineer than to send an executive back for a four-year engineering course.

(2) The local, national and international influence of American executives is so penetrating that "we must start breeding a generation of technical managers who have a strong feeling for the social consequences of their jobs," according to Prof. Morris Asimow, director of the program.

The program will stress the use of quantitative techniques in solving administrative problems, the executive's evaluation and decision-making functions, operations research and group behavior.

Information and applications may be obtained from the Engineering Executive Program, Department of Engineering, University of California, Los Angeles 24.

West Coast AMHS Chapters Hear Authority in Handling

AN AUTHORITY IN material handling talked to the San Francisco and Los Angeles Chapters of the American Material Handling Society at their January meetings. Frank C. Wier, a consultant in material handling, who recently retired from the Timken Roller Bearing Company, lectured on "Men and Machines in Handling."

He made a number of interesting points on the technique of handling stating that it is a service similar to "water from a spigot" which must never be wanting. Commenting on the difference between handling and applying of an industrial process Wier said that the only thing affected by handling is an alteration of geography which causes no change in the material. It therefore requires no need for paperwork except charts and certain final dispositions and should be free as the air.

Handling expense is not the prime consideration in itself, so long as the cost of the product going out the door is adequately decreased, Wier stated. Among other things Wier warned that a handling program must be under supervision and the supervisors must be willing and able to handle the most minute detail accurately and well or the system will collapse.

Western Electronics Show and Convention

TWO ELECTRONICS EXECUTIVES, Calvin K. Townsend and Dr. John V. N. Granger have been appointed to the Board of Directors of WESCON (Western Electronic Show & Convention). Townsend was named by the Western Electronic Manufacturers Association and Dr. Granger was chosen by the San Francisco Section of the Institute of Radio Engineers. Townsend is executive vice president and chairman of the board of Jennings Radio Manufacturing Corp. Dr. Granger is president of Granger Associates.

Both men will serve for four years on the eight man board and direct policies of the trade show and technical convention which alternates yearly between Los Angeles and San Francisco.

The steering committee for the 1960 conference has selected a theme of "Today's Facts on Tomorrows Handling and Packaging Problems", considering it descriptive of the technical data to be discussed. The conference is

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MEETINGS

(continued)

sponsored each year by The Northern California Chapter of The American Material Handling Society and The Golden Gate and Central California Chapters of The Society of Packaging and Handling Engineers. The steering committee is comprised of two representatives from each sponsoring group.

Military Packaging Seminars

DATES AND LOCATIONS for military packaging seminars for industrial managements have been announced by the Office of Naval Material, Washington, D. C. The sessions are open to industry management and packaging executives concerned with military packaging requirements.

A general review of military requirements will be presented in the seminar. In addition the soon to be introduced packaging requirements code system will be discussed. This new system will have a major impact on industry since it will soon be used by segments of each of the military departments to describe packaging requirements in military contracts.

The system uses 14 digits to describe detailed packaging for nearly 85% of all military items and contractors will be required to decode and encode packaging requirements by this system.

Here are the dates and locations of the packaging seminars held in the West. or time and specific location contact the sponsoring Inspector of Naval Material office.

Session Location	Date	Sponsoring Office
CALIFORNIA		
Long Beach	Mar. 16, 1960	Inspector of Naval Material 703 Federal Building Long Beach, California HEmlock 2-8967
Lynwood	Mar. 18, 1960	Inspector of Naval Material 929 South Broadway Street Los Angeles, California Richmond 9-4711
Riverside County	Mar. 21, 1960	"
San Fernando Valley	Mar. 22, 1960	"
Santa Barbara County	Mar. 23, 1960	"
San Francisco	Mar. 11 & 14, 1960	Inspector of Naval Material Bldg. 178, Treasure Island San Francisco 19, California EXbrook 2-3931
OREGON		
Portland	Mar. 10, 1960	Branch Office, Inspector of Naval Material 615 Lincoln Building 208 S. W. 5th Avenue Portland 4, Oregon CApitol 8-3361
WASHINGTON		
Seattle	Mar. 8, 1960	Inspector of Naval Material 2300 Eleventh Ave., S.W. Seattle 4, Washington MAin 2-1472

Reliability Symposium in L. A.

A RELIABILITY SYMPOSIUM will be held at the Statler Hilton Hotel, Los Angeles, on February 24. The Symposium sponsored by the Los Angeles section of the American Society for Quality Control will include a 5-point program that covers the following subjects: Definition, Organization, Cost, Development, and Testing. Co-Chairmen of the Symposium are Frank H. Squires and Jack Lancaster.

SPHE National Officers



THE SOCIETY of Packaging and Handling Engineers national officers met in San Francisco for a Board Meeting on January 23. This is the first meeting that the new officers of SPHE have had together since their recent inauguration. National officers for 1960-62 are, left to right: Vice President, Harold Kilmer of North American Aviation Co.; Board Chairman, John Mount, Insurance Co. of North America; Executive Vice President, Al Lowinsbury, Edgar's Warehouses; President, Charles Lippman, Columbia-Geneva Division, U. S. Steel; Secretary, Elaine Pitts, Sperry & Hutchinson; Vice President, Ken Moulton, General Electric Co.

L. A. Chapter Active in Making Arrangements for Welding Society's Annual Convention

LOCAL ARRANGEMENTS for the American Welding Society's 41st Annual Convention and Welding Exposition in Los Angeles, April 25-29, are being made by the Los Angeles Section under the direction of C. P. Sander, chairman of the AWS Los Angeles Arrangements Committee.

The following committee appointments have been made:

Arrangements Committee—Chairman: C. P. Sander, General Superintendent, Consolidated Western Steel Division, U. S. Steel; Secretary: D. A. Elmer, Methods Engineer, C. F. Brown and Company.

President's Reception—Chairman: E. O. Williams, Vice President, Victor Equipment Company; Vice Chairman: E. A. McCorkle, Vice President, Air Reduction Pacific Company.

Welded Products—Chairman: A. L. Collin, Chief Development Engineer, Kaiser Steel Company.

Meeting Sessions—Chairman: R. J. Frick, Assistant Regional Manager, Linde Co. Div. of Union Carbide Corporation.

Technical—Chairman: S. E. Hickman, Chief Welding Engineer, Aerojet Corporation.

Banquet—Chairman: F. V. McGinley, Branch Manager, Victor Equipment Company.

Hospitality—Chairman: D. P. O'Connor, Senior Machinist Foreman, Los Angeles Dept. of Water and Power.

Ladies' Entertainment—Chairman: John B. Ross, Sales Representative, Engelhard Industries.

Signs—Chairman: J. M. Soyars, District Manager, National Cylinder Gas, Div. of Chemetron Corp.

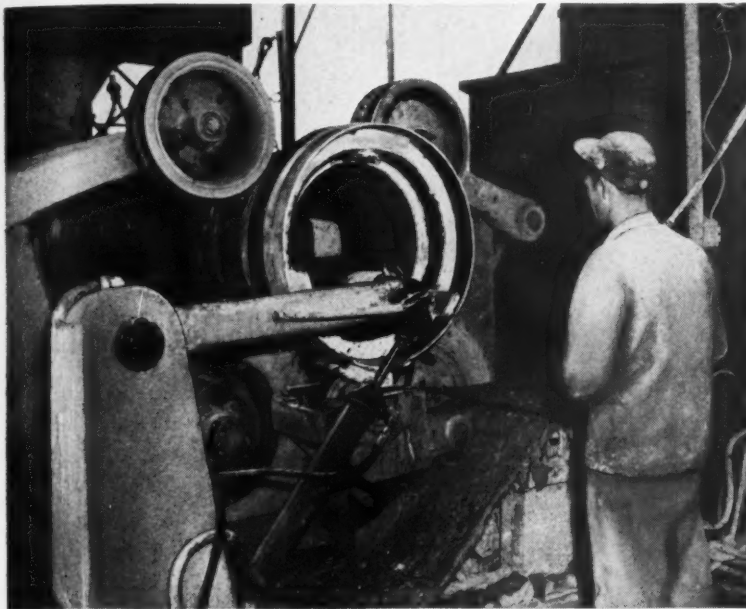
Plant Tours—Chairman: A. M. Thompson, General Manager, Fabriform.

Publicity—Chairman: L. M. West, Welding Engineer, Douglas Aircraft Company.

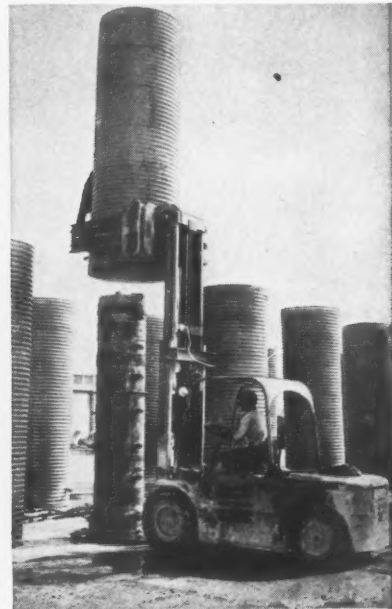
STANDARD ENGINEER'S FIELD REPORT

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Plant Supervisor Dick Davis, points to one of machine's hydraulically operated eccentric vibrator wheels. "We're well satisfied with the performance of **Chevron OC Turbine Oil**," reports Mr. Davis. "In both our pipe machines and our fork trucks it's kept hydraulic cylinders working smoothly and reliably in spite of the heavy loads, grit, and moisture in our type of operation."

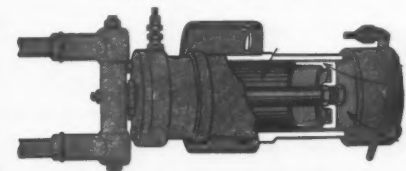


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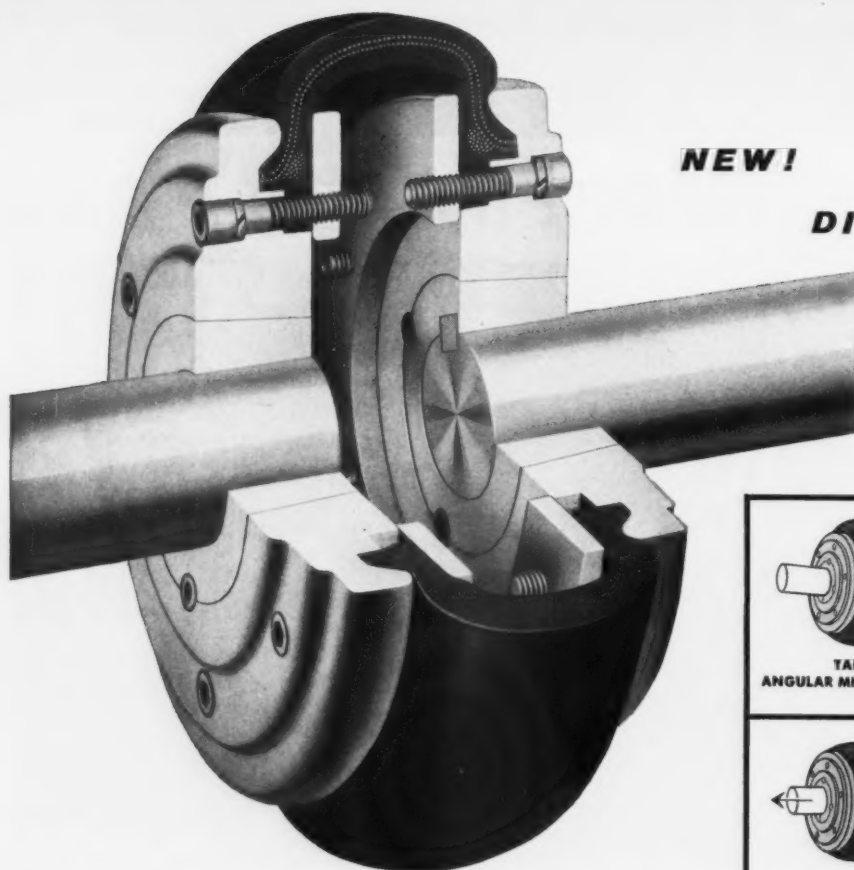
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Why Chevron OC Turbine Oil
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- Contains effective oxidation inhibitor—will not deteriorate and plug lines or retard action of cylinders.
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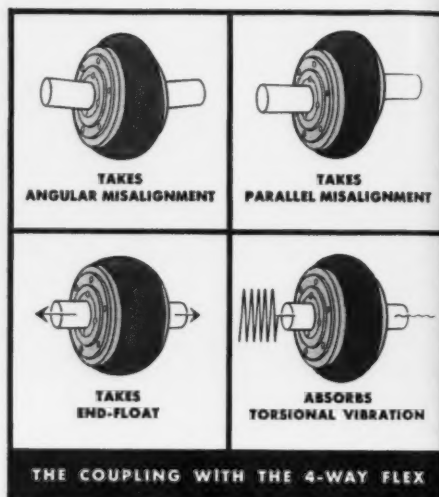
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Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

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parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced *without moving either the driver or driven machine*.

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WESTERN INDUSTRY/FEBRUARY 1960



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Downtime is eliminated! The Clark Rental System maintains a standby fleet of equipment for your immediate use when an emergency arises.

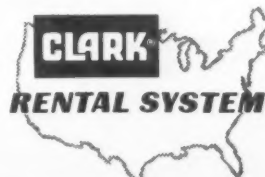
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The new blade design permits cutting a tight radius either right or left . . . smoothly . . . easily . . . without jamming. The shear blade slices with power and precision through sheet metal . . . *even Monel and stain-*

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Work edges are smoothly finished right along the cutting line, without further trimming or deburring. A quick twist of the adjusting screw positions the blade to cut any metal thickness to 16 gauge . . . heavier on trim cuts and aluminum.

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WESTERN INDUSTRY/FEBRUARY 1960

HOW TO SELECT YOUR Western plant site

Selecting the right site for your Western plant calls for detailed planning that pays off in lower construction and manufacturing costs. This report explains how to go about it, giving special emphasis to those Western differences that must be recognized.

WESTERN PLANT SITE selection used to be made by management deciding on an area and sending one or two of their top men on a week trip to find a likely looking site, which was then purchased. This is no longer the case, for industry has learned that such a casual approach can be very costly.

The correct selection of a Western plant site is one of the most important and at the same time difficult decisions a firm can make. It requires complete and painstaking investigation, an investigation that includes the talents of engineers, market researchers, economists, mathematicians, and scientists. The right plant site location can reduce plant construction costs and even influence manufacturing costs to such an extent, as to give that firm an extremely strong competitive position. On the other hand, an incorrect decision is often very costly, both in initial cost and in future manufacturing costs.

To start in, today's manufacturer should first determine his specific reasons for wanting a Western plant. The decision to relocate or establish a branch plant is usually based on a thorough analysis of the firm's financial standing, as well as its competitive position and marketing pattern.

Once a manufacturer has determined to seek a suitable plant site in the West, one or more persons are placed in charge of the operation. Some firms severely limit the number of persons involved, for reasons of secrecy or company size; others, while still interested in maintaining secrecy, set up a planning group to work on the project. There is a definite trend, particularly in medium to large industrial firms towards setting up a planning group. Such a group can bring together men with the diversification of talents and knowledge necessary to make a correct plant site decision. In some organizations, the group personnel are high level key men, and assume this task in addition

to their regular duties. However, other firms assign personnel to the planning group on a full time basis until a plant site is picked.

Each individual plant site selection is different. No two firms are identical and, therefore, no two firms have identical needs. It is true similar firms have similar needs and sometimes tend to locate in the same area, but any attempt to make a rule to go by from this fact would be disastrous.

Therefore, the next step the manufacturer must take in locating a Western plant site is to determine his particular needs. A list of the firm's specific needs and general plant requirements should be developed. The list should be as complete as possible and those requirements that are considered of primary importance should be so noted. Considerable time and effort should be spent on this list and on the relative importance of the various items it contains. It is obvious that no plant site will completely satisfy all of the requirements on the list, and as more and more plants are located in an area, plant site selection will become increasingly difficult. The actual selection, therefore, is usually determined by compromise, and the site chosen is one which fits the basic needs of the manufacturer and satisfies as many other of the requirements as possible.

Selecting a plant site in the West has certain differences and peculiarities not found in other areas. Because of the great distances involved, the problems of transportation must be studied thoroughly. Marketing areas also require a complete investigation. Marketing areas are expanding with the West's industrial growth, and any investigation must include future growth patterns, both from a size and a location standpoint. The problems of water supply and soil composition are different from other parts of the country. Here again,

CHECK LIST OF WESTERN PLANT SITE REQUIREMENTS

General plant location area	Mail & express facilities	Type of equipment
Nearness to market area	Adequate communications	Future type of equipment
Future market growth and location	Customers attitude towards location	Attractiveness of plant
Nearness to raw materials	State legislation and taxes	Building codes
Adequate labor force	Local legislation and taxes	Type of neighboring industries
Potential labor supply	Future taxes	Air pollution problems
Type of labor force	Insurance	Amount & type of waste
Labor legislation	Financial arrangements	Adequate sewage disposal facilities
Water supply, amount & kind	Land costs	Zoning
Soil conditions	Site preparation cost	Climate
Utilities, close and adequate	Building cost	Community attitudes
Industrial fuel requirements	Type of structure	Size of community
Favorable transportation rates	Size of available sites	Attractiveness of community
Rail transportation	Plant size	Adequate housing
Truck transportation	Expansion possibilities	Adequate schools
Commercial air service	Plant layout	Major educational institute
Adequate access roads	Product manufactured	Cost of living

water supply needs should be examined, not only from present needs, but from future expansion needs and future supply. The type of water needed is another consideration, for some industrial processes do not require pure water. This has a definite effect on site consideration.

Another important difference in the West, is the type of plant construction. The construction of Western plants is definitely affected by climate and often different construction materials are used. Plant cost is thus affected. In plant operation too, many industries sometimes can utilize outdoor storage of raw material and products in certain Western areas, not feasible elsewhere. One firm, Linde Co., Division of Union Carbide, has built its Pittsburg, California, new liquid oxygen-nitrogen plant almost completely outdoors, the first of its kind to be built in this manner.

Most Westerners drive cars, and are used to driving long distances to get places. Plants built in the West need large adequate parking areas. This is important in a consideration of site size and future expansion plans.

One industry particularly Western, electronics, is less concerned with transportation facilities than with the availability of a major educational institution, where their scientists can gain additional degrees and be close to a source of research. The electronics industry must also have a source of supply for high level scientific and engineering personnel. When Lockheed acquired a 200 acre site at Newport Beach, California, for the establishment of its new electronic science and production center, a study group set up eight basic criteria. One was that the area must be reasonably accessible to a major educational institution. Another was that the environment must be favorable for attracting scientific and engineering talent. Here is all they looked for transportation-wise. "There should be good highway access and a sufficient local road network for transportation of supplies and for flow of employees to and from work."

Once a firm has decided exactly what it wants in the way of a plant site, there are a number of ways to go about finding a correct location. Many different groups and organizations will provide information on plant site

selections or various phases of it. Some of these organizations render their services free, others charge. How much actual investigation the searching company itself does is an individual problem that must be decided by each company. A firm looking for a Western plant site may wish to make its own decisions and draw only slightly upon the services offered by the various groups, as the investigation proceeds. On the other extreme, a firm may decide to place the complete investigation and selection in the hands of one of the organizations, which specialize in complete plant site location. This type of organization usually works on a fee basis. Between the firm that does its own plant site investigation and the one that does none, there is a middle course which many firms seeking plant sites follow.

A list of types of organizations which offer services in plant site selection will include the following: Research organizations, Architect and Engineering firms, Industrial Realtors, Banks, State Governments, Railroads, Utility Companies, Steel and Construction Companies, Private Development Corporations, Local Governments, Chambers of Commerce.

The services that these organizations offer naturally vary greatly. Some groups offer a complete site selection service; others are concerned only with one small area. All are valuable and have their place. In general, here are the services performed by some of the different groups.

RESEARCH ORGANIZATIONS

Private research organizations are excellent in giving an impartial evaluation of the problem. Their services can be as complete as the manufacturer desires. Not only will they evaluate various areas and pinpoint suitable locations, but they also determine the size, type of plant, or plants needed and future expansion plan for the firm. Their use should be considered especially if the selection problem is particularly complex.

A typical example of how research organizations work, is the study that Stanford Research Institute made for Heublein, Inc., when that firm desired to locate a new and enlarged operation on the West Coast for processing and canning various types of soup, bottled distilled spirits, and also distribution of other specialty food items processed in their East Coast plant.

The problem was, that proximity to market and raw materials is sometimes difficult to achieve when a company's product lines are dissimilar. In this case, calculated distribution costs computed on the basis of present and anticipated-future market characteristics were found to be slightly in favor of the San Francisco Bay area. This region was also in a more central geographical location in respect to the client's anticipated market region. Customers' shipments handled from the San Francisco area, as a result, would receive better service. In all, greater economy and operating efficiency would be enjoyed by the company.

Lyon Metal Products, Inc., Aurora, Illinois, contracted with Stanford Research Institute to make a study of Lyon western markets and to recommend the best location, taking into consideration present markets, distribution, future growth, type of required labor, etc. The report, which required four months of study, recommended an area, in which Lyon then proceeded to purchase a two year old plant, some 18 miles from downtown Los Angeles.

ARCHITECTS, ENGINEERS, STEEL & CONSTRUCTION FIRMS

Because of the inter-relationship between plant design and type of site, these organizations can be invaluable in helping select a site that will best suit a client's needs. Instead of adapting a plant to a plant site, it is usually far better to select the site with the basic plant requirements in mind.

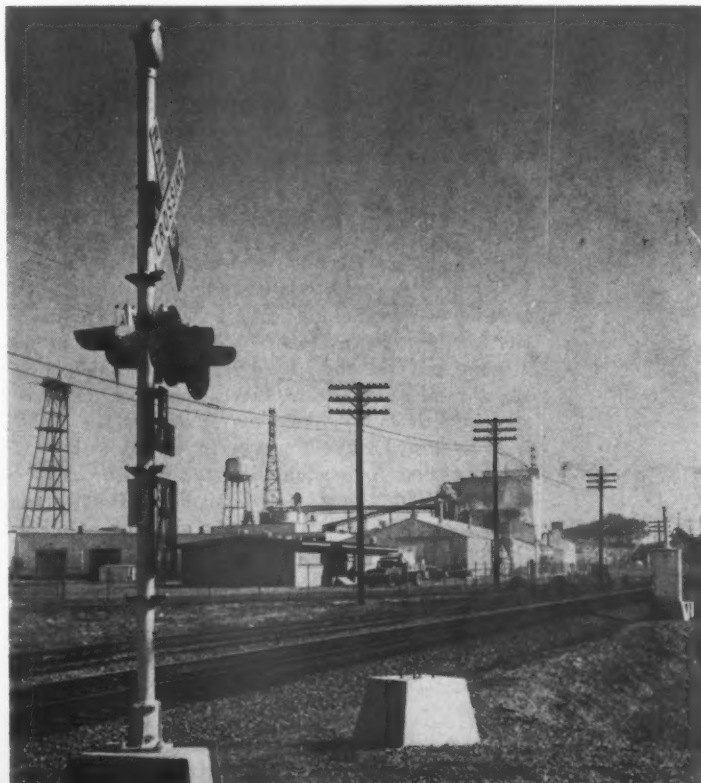
An example of this is given by Soule' Steel Company, an organization that manufactures metal building products and specializes in co-ordinating site and structure. They constructed a warehouse on tidal ground in the San Francisco Bay area. Because of the marshy nature of the soil, a three-hinged arch type of structural frame was used. The building columns were also enclosed in sleeves to prevent distortion. These innovations allow the warehouse to move without weakening its structural value. The head of Soule's industrial planning group explained, "In this case, the customer had no choice, he already had the land and was forced to utilize it in the best way possible. This is a rather costly illustration of the importance of having a good site on which to build."

Often organizations of this general type are called upon to assume complete responsibility for the entire site selection problem. For instance, Welton Becket & Associates, Architects and Engineers, maintains a planning division, staffed with master planners, civil engineers, economic analysts, landscape architects, and zoning experts. Recently, this organization had a client already determined to locate in a general area, who presented them with area requirements, functions to be performed in the plant, and eight sites which the firm was considering. Five sites were quickly eliminated, and the final three given intensive study. Contacts were made with municipal, county, state, district, and utility officials. Soil grading, street improvements and present and future value were all analyzed. Each site had pros and cons. These were listed and evaluated, and a cost analysis made for each of the sites. In light of the total evaluation, site B was recommended as most suitable, if the firm could wait a reasonable length of time for re-zoning. Site A was recommended, if more rapid acquisition was required.



INDUSTRY LOCATES in Santa Rosa. Fersolin Corp. plant manager Clifford Mills, Pacific Gas & Electric's John Walsh, John Harrison of Sonoma County Industrial Development Board and Thomas Ludcke, Santa Rosa District Manager (left to right) survey site. PG&E assisted firm in finding a suitable site.

TRANSPORTATION WAS large factor in selection of this site for Kaiser Gypsum Co. at Sando, Calif. Plant is located on Santa Fe main line and railroad assisted company in selection and purchase of site.





SITE FOR Amphenol Electronics plant in San Fernando valley was selected through cooperation of industrial development unit of Los Angeles Department of Water and Power.

INDUSTRIAL REALTORS, BANKS

Industrial realtors offer much the same type of service as other realtors. Some of the larger industrial realtors, not only are able to effectively cover a large area, but provide additional services in plant site selection. Banks are another type of organization that should be contacted. In the West, there are a number of large banking firms, which cover wide areas. Since banks are vitally interested in business conditions, they are good sources for financial and market information, from both a local and a general area standpoint.

UTILITIES, RAILROADS

Both of these groups are very active in assisting firms to secure plant site locations and can be extremely helpful.

Utilities, such as Pacific Gas & Electric in Northern California and Southern California Edison in Southern California maintain area development departments to handle inquiries from firms seeking to locate in the area they service. Utilities offer a wide variety of free services to prospective firms. They provide information on land values, population trends, tax rates, availability of property and other location factors. Not only do utilities work with prospective firms, they also work with and advise research and investigating organizations seeking possible industry plant sites in their area for clients.

Pacific Gas & Electric, for instance, was contacted by Stanford Research Institute, who had been retained by Libby-Owens-Ford, to find a Northern California site for its new glass factory. The site had to be on a major rail line and have large amounts of natural gas and water available. PG&E engineers located every spot in their territory where a major gas line paralleled or crossed a free-flowing river. Places with flood danger or poor foundation soil were eliminated, as were those far from highways and rail lines. From a list given them, SRI experts selected a site near Manteca, California, served by a major railroad and adjacent to Highway 50 and the San Joaquin River. Not only is there a major gas line there, but the site is in the midst of a transmission tower complex that assures continu-

ous power.

Railroads are also extremely active in helping select plant sites for prospective clients. Their free services are similar to those provided by utilities. Because of the general transportation problems in the West, this group is an important one from which to seek assistance. Since a railroad covers large areas, it is particularly useful to a firm in selecting a number of smaller areas as potential site locations. Quite naturally railroads are interested in those firms requiring rail transportation.

For some time Western railroads have recognized the importance of land for industrial purposes along their rail lines. Santa Fe, for example, owns many industrial tracts located throughout the West. It will sell land in these tracts or help the firm select another site. The railroad is not interested in owning and selling land as a business, but has merely acquired the land so that it will be available to an industry that needs a plant site near a rail line. Other railroads operate in much the same fashion, and also have industrial tracts.

DEVELOPMENT CORPORATIONS, LOCAL GOVERNMENTS, CHAMBERS OF COMMERCE

These groups have a basic similarity, in that they operate on local area level. They are interested in attracting industry to either a city, county, district, or an industrial park. The information that they can provide is excellent, when the manufacturer seeking a plant site has selected that area as one of the areas or area in which he wishes to locate his plant.

Local governments and chambers of commerce all over the West are seeking industry, and some offer certain incentives to the firm locating in their area. In general though, the practice of offering incentives to industry is not as strong in the West as elsewhere in the country.

All of these groups have issued informational pamphlets about their area. This information and other services of this type are provided free of charge. Los Angeles County, the Los Angeles Chamber of Commerce, the Long Beach Chamber of Commerce, and other Los Angeles area organizations are particularly active and have a large number of booklets and informational pieces on industrial selections. They are not alone, though, and information may be acquired about such varied areas as Santa Clara County, California, Ogden, Utah, Pocatello, Idaho, and Fresno, California, to mention only a few.

In selecting your Western plant site location, here are the steps to take:

1. Find out your reasons for building a new Western plant.
2. Select within your firm, either a group or person to be in charge of the operation.
3. Make a complete listing of your plant site needs and requirements and make special note of those requirements that are of primary importance.
4. Make, or have made, a complete investigation, starting with a broad general area, and from it, select one or more local areas.
5. Select a favorable site in these areas and proceed by process of elimination to select the one that best fits your requirements. As the search narrows, the investigation becomes more thorough.

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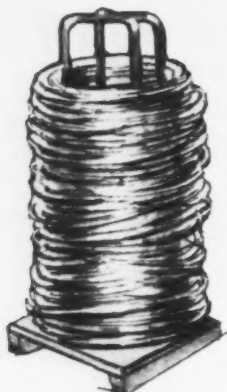
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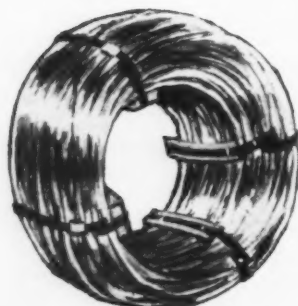
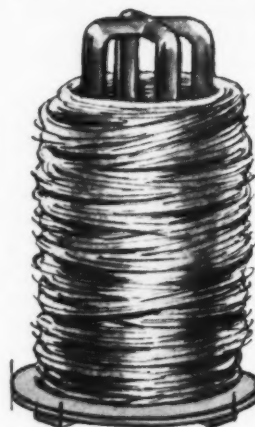


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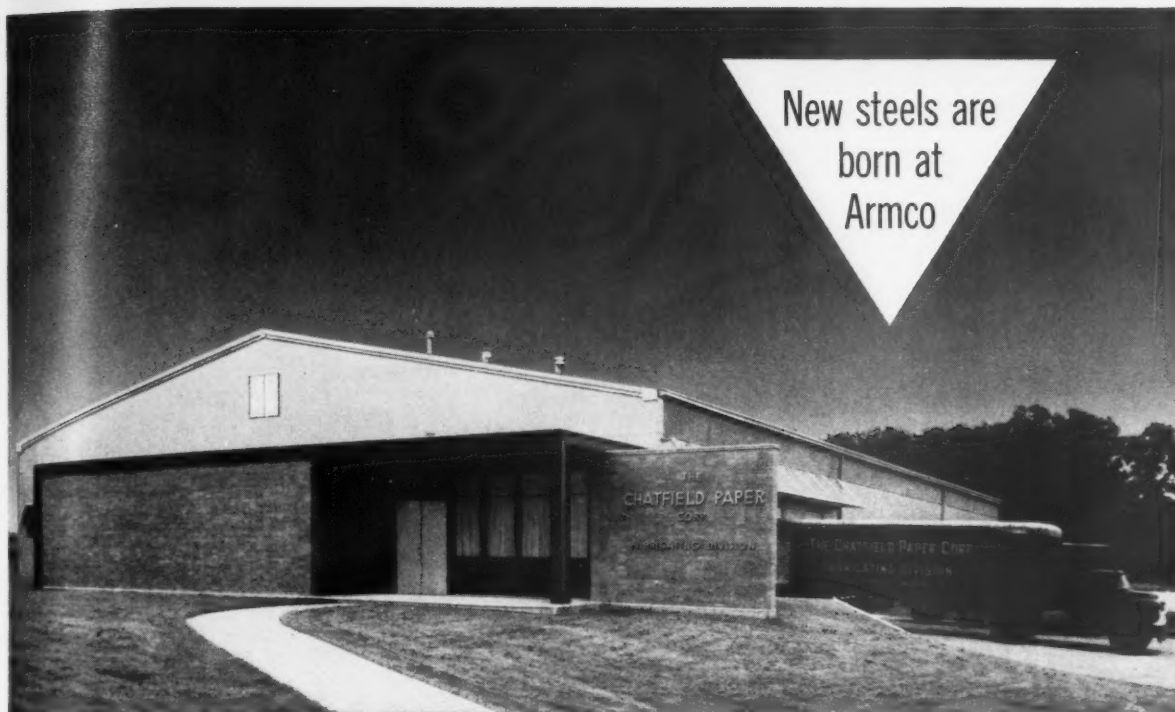
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WESTERN INDUSTRY/FEBRUARY 1960

21/64 / SPECIAL REPORT

29/46 / METALS

32 / COMMUNICATIONS

31/44/46 / MATERIAL HANDLING

34/39 / MANAGEMENT

41 / DESIGN

34/37/50 / PRODUCTION

52 / MAINTENANCE

48 / PACKAGING

FEBRUARY 1960
Vol. 25 No. 2

western
industry



NEW DEVELOPMENT in shell casting field

New shell casting process is faster, costs less and allows closer tolerance in parts.

A NEW PROCESS of shell casting that permits production of many airframe and missile parts with greater speed, lower cost, and closer tolerances has been developed by Ferro Cast Div., J. B. Rea Co., Santa Monica, Calif., supplier of castings to North American Aviation and other West Coast aircraft firms.

The development employs basic techniques of investment casting, but replaces heavy investment-filled steel flasks with a relatively thin, tough coating surrounding a disposable wax pattern.

Shell material costs approximately 65% less for a 10-lb., pouring and 85% less for a 50-lb. pouring. The weight of the shell can be as little as 1/10 the weight of the filled steel flask and substantially reduces dewaxing and curing time.

The foundry reports a finer molecular grain structure and regulating of grain size in non-heat-treatable alloys is possible since the thin and more uniform shell offers even, rapid cooling. Foundry headaches associated with excessive stresses and hot tearing can be prevented and shrinkage values parallel those obtained with standard investment casting procedures.

A typical case history involves casting of a turbine nozzle by the Ferro Shell process and the comparison in time and cost with conventional investment casting.

Ferro Cast's new shell weighs 5-lbs. and takes 14½ hours to produce the turbopump nozzle compared with an investment-filled flask formerly used weighing 85-lbs. and taking 4½ days of processing from wax pattern to casting cycle.

Figures below offer a comparison between casting

of the nozzle by either process.

CASTING STEPS	FERRO-SHELL	INVESTMENT CASTING
Dip.....	5 hours	48 hours
Invest.....	none	24 hours
Dewax.....	20 minutes	
Fire.....	7 hours	20 hours
Pour.....	negligible	negligible
Cool.....	2 hours	6 hours
Shakeout.....	10 minutes	30 minutes
	14½ hours	98½ hours (4 days 2½ hours)

Cost of shell materials was \$2.50, about 50% less than those used for investment casting. Since shrinkage values were the same as investment castings, no new tooling was needed for pattern molds. Ferro-Shell coatings dry at room temperature in 10 minutes between dips and without need of drying equipment.

De-waxing is accomplished by vapor elimination of patterns that nets 95% pure wax, free from contamination caused by de-waxing methods such as flash firing. Shells can be placed in ovens at top curing temperature and do not need gradual heat-up during the firing process.

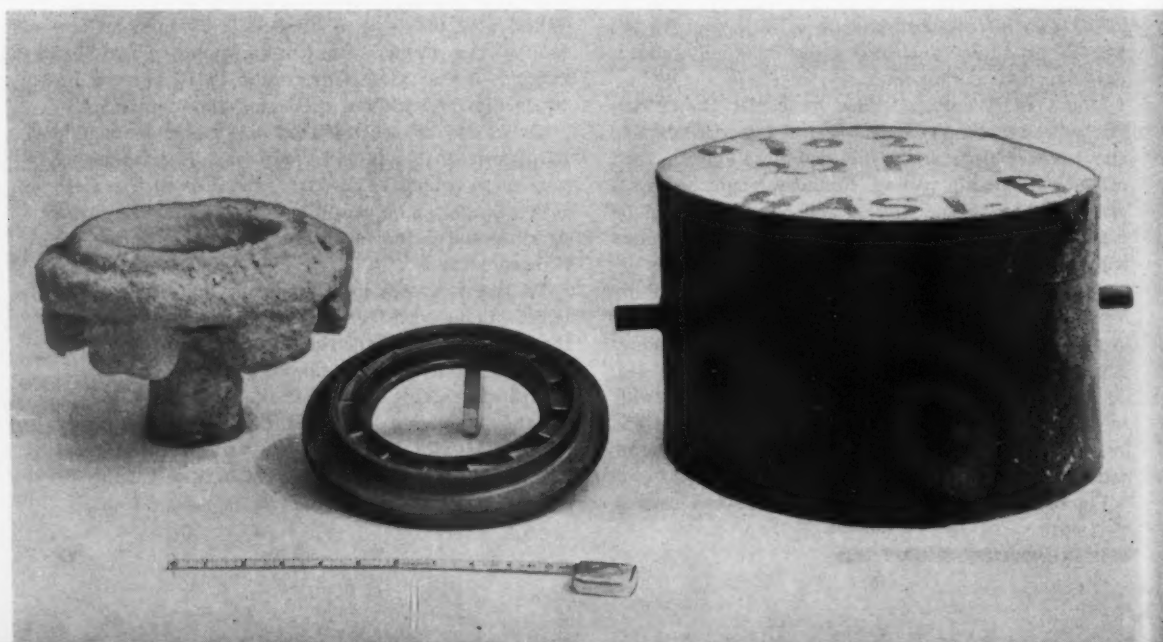
Pouring is accomplished statically on an open sand table without need for backup material to protect the shell. While cooling, the shell does not offer resistance to metal shrinkage, but simply crumples and avoids hazard of cracking and hot tearing.

After crumbling, the shell that remains is easily removed by vibrating machines. No forceful removal is needed and the structural and surface quality of the casting is preserved.



AFTER WAX PATTERN has been melted out and the shell has reached proper temperature, molten alloy is poured statically into the shell. Thin wall sections of shell permit fast metal cooling after pouring.

NEW SHELL (at left) is now used for casting turbopump nozzle shown in center. Only 14½ hours labor are required to produce casting from wax pattern. At right is 85-lb. Hastelloy B investment-filled flask.



STEEL CONVEYOR

moves hot materials

Construction of steel apron conveyor for carrying hot sinter solves problem, stops belt replacement and high maintenance and repair costs.

PLANT ENGINEERS at Kaiser Steel's Fontana, Calif., plant were asked to look into a request by the blast furnace department for the purchase and installation of a straight-line sinter cooler. The reason—the sinter plant's two rotary coolers could not cool the hot sinter enough to keep it from periodically burning out the rubber conveyor belting, which transported the sinter to the stockpiles.

During a past average year, the maintenance and replacement costs for this rubber belt conveyor system amounted to \$42,566. The thought was that more efficient cooling of the sinter would reduce this amount considerably.

Cost of the straight-line cooling unit under consideration was in the neighborhood of \$600,000—a fairly large capital outlay, but one that would pay for itself over a period of years.

The rubber belting used was 36 inches wide, 42-ounce, 4-ply construction with a 5/16-inch top cover. Despite its heat-resisting qualities, it could not withstand the tremendous temperatures of some of the large clinkers of sinter—some more than 1-foot cube which were yet red hot inside when deposited onto the rubber belting.

Upon thorough investigation, plant engineers recommended replacing the rubber belt conveyor unit with a steel apron transport system. The recommendation was accepted and the installation was made at a total cost of \$48,000—just \$6,000 more than a year's cost of maintenance and repair of the rubber belting.

In order to minimize "down-time" of the sinter machine, crews built the new steel apron conveyor on the existing structural work and over the rubber belt conveyor. Complete installation was accomplished in approximately three days.

Immediate effects of the new operation were noteworthy to the blast furnace department. Speed of the sinter producing machine was upped from 84 inches per minute to 90 inches per minute—a 7.15 per cent increase.



STEAMING SINTER (chunks of fused coke and iron ore fines) moves out of rotary cooler on a steel conveyor at Kaiser Steel's Fontana mill. Steel belt replaced rubber one that periodically failed.

The rubber belt conveyor to the stockpiles traveled at 270 feet per minute. The new steel apron conveyor travels at only 90 feet per minute affording better cooling time for the sinter before it reaches the stockpiles. It handles approximately 200 tons per hour.

The steel apron conveyor is 30 inches wide and travels a distance of 265 feet from the rotary coolers to the exit point above the stockpiles.

Engineers at the plant report that during the first year of operation practically no maintenance and repair was necessary on the new unit.

CLOSE UP of steel apron conveyor used to transport sinter to stockpiles from sinter cooler.



COMMUNICATIONS SYSTEM

for fast production control

Small belt-clip radios on key plant personnel bring high speed communications that cut unnecessary production downtime.

THE SAN JOSE, California plant of Continental Can Company recently completed the installation of a radio paging system especially designed by Motorola to provide high speed communications for key plant personnel.

Small 10-ounce "Handie-Talkie" receivers are carried clipped to the belts of key men in Management, Inspection and Production. Attached to each receiver is a feather-weight cord leading to a plug-type receiver worn in the ear. The units will operate for several weeks on a tiny 4-volt mercury battery.

Located at strategic points throughout the plant are dial telephones that can operate the FM transmitter. To initiate a call a phone is picked up and a two digit call number dialed. Only the man wearing that receiver hears a buzzing which tells him he has a call. He presses a switch on his receiver which causes a dial tone on the telephone. The man phoning knows that his call is being received and his verbal message will be heard.

Two phones are located in the can assembly area, both in booths to reduce any existing noise. Three phones are in the warehouse in each of the three packing sections. One phone is in the Quality Control Lab. Another phone is at the switchboard. Receivers are carried by the Plant Manager, Assistant Plant Manager, Plant Engineer, Supervisor of Inspection, Chief Inspector and Division of Resident Inspector. Units are also carried by the foreman of can assembly, the foreman of shipping, the warehouse supervisor, and by all inspectors. When VIP personnel from outside the plant are visiting, they are given a receiver to carry and are notified of incoming calls by the switch board operator.

This communication system has eliminated any unnecessary downtime on machinery while the search is on for indispensable maintenance experts. A foreman picks up a nearby phone and quickly dials two digit to contact a maintenance specialist. He listens to a brief tone that tells him the maintenance man's receiver is



QUALITY CONTROL inspector, Tony Rodeo, calls can assembly foreman on radio communication system and describes fault located in product.

responding and states the problem, knowing that his words are going directly into the man's ear no matter where he may be in the plant. Thus the plant engineer or foreman at the site of the breakdown can instantly talk to his men, directing them to the scene and advising them of the materials needed.

Quality Control personnel and machine operators have found the radio system virtually eliminates many of the problems of line switching and correction of potential defects. As Production switches from one line to another, the inspectors are advised of the changeover and immediately move to the new location.

The radio paging system has a direct effect on the reduction of scrap materials. When an inspector detects the appearance of a potential flaw, he immediately advises the machine operator who may be able to make the necessary adjustment before the line starts to run substandard cans. A sudden flow of rejectable containers can now be withheld from production, with a speed previously unknown in the industry.

A special feature of the system is three monitor



PLANT MANAGER, W. K. Brown, has monitor unit on desk and hears all messages. Being constantly informed on plant production problems he can step in personally when the situation warrants.

speakers on the desks of the plant manager, assistant plant manager and the quality control supervisor. These executives can listen to every message allowing them to follow all production problems to their conclusion.

The installation does not require an FCC license. It is completely free from interference by other local radio transmitters. The equipment can operate 24 hours a day and is maintained by one of the manufacturer's Service Stations located in San Jose.



CAN ASSEMBLY foreman, Gene Rich, receives message from Quality Control inspector which will immediately allow him to make necessary production adjustments. Note radio unit on belt and cord to plug-type ear receiver.

ENGINEERING CHANGES, new system cuts their cost

An estimated \$52,000 is saved annually

A NEW SYSTEM for handling engineering changes initiated by Aeronca Manufacturing Corp. has saved an estimated \$52,000 annually, according to E. V. Gustavson, director of Aeronca's Engineering Div.

Aeronca operates West Coast facilities in Los Angeles and Torrance, Calif. and is a major fabricator of airframe assemblies for the Boeing 707, KC-135 tanker, the B-52, B-58 jet bombers and other aircraft.

About 12,000 engineering changes per year are processed by Aeronca and the reduction in costs of such changes has been made in three categories; personnel, paper work, and equipment.

Reduction in personnel costs came through better allocation of time. Formerly all changes were reviewed and processed by a Change Board of eight men that met three times weekly. Time was lost in traveling to board meetings and because members had other responsibilities.

The board was reduced to three full time members meeting in continuous sessions. Board responsibilities were increased to include not only specifications but also in followup to see that the changes were made on

schedule.

Paper work was simplified to reduce man hours needed for processing. Reduction in the number of forms used and the copies required made for additional savings.

In one department, 27 paper-work operations were scrapped and one form replaced six others used previously. The number of copies per change was reduced by 227. This resulted in saving 587,700 sheets of paper at a cost of \$1500 for printed forms alone.

Less paperwork resulted in fewer filing cabinets. Forty of these, valued at \$3400 have been eliminated. This figure does not include value of saved space.

Other savings totaling \$7600 resulting from reduced paper handling (after forms were completed) such as filing, sorting, matching, referencing, locating, etc. have been achieved.

Many engineering changes involve cost increases in materials. Within a specified time limit, the company must apply for recognition of this price increase in work contracts. Since the new system has been in effect, the company has been able to compute and apply for all increases within the time limit.

MECHANIZED WELDING increases production speed

Reduces production costs by 50%

AFTER USING manual welding methods to fabricate reaction coils for the chemical industry, Hilton Products Company, Seattle, Washington, decided there must be a better way to do the job. They installed Linde Company's mechanized Sigma welding process. Now that this high-speed, inert gas process is in full production use, there is no comparison to the previous method.

Here are the results: production records show that mechanized welding saves at least 50% on overall production costs, greatly reduces weld distortion, minimizes clean-up, and boosts production speed by over 300% with a welding speed of 60 inches per minute.

Reaction coil parts are made from 316 ELC, schedule 10, stainless steel pipe. To join the 6-in. diameter pipe, Hilton uses an SWM-2 Sigma welding machine, equipped with an HW-13 torch and mounted on a Linde CM-48 side-beam carriage. Welds are made

with Oxweld No. 316 stainless steel wire, 3/64-in. diameter, at a current setting of 200 amp., 28 volts. DCRP. A flow of Linde H-5 argon prevents weld contamination.



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PAINT SYSTEM

handles 12,000 units daily

New preparation and painting line for lighting fixtures designed to increase production per time unit and cut costs.

A METAL PREPARATION and painting line that is semi-automated and uses natural gas-fired equipment capable of handling from 4000 to 12,000 parts daily, depending on size, has been opened by Smoot Holman Co., Southern California producer of commercial and industrial lighting fixtures.

The facility is part of a new 140,000 sq. ft. plant manned by 252 employees at 321 N. Eucalyptus Ave., Inglewood, Calif.

Objectives of the new line were to substantially increase production per time unit with reductions in labor and material costs.

Other considerations were choice of equipment that would provide superior pre-paint metal treatment, dry off, painting, and baking.

This is what happens to a metal component from the time it enters the loading pit for attachment to the

conveyor system until it emerges for warehousing to await requisition by the fixture assembly department.

After parts are loaded on the makeup conveyor they are transferred to the main conveyor line equipped with alternate hangers, one rotating and one non-rotating, to permit flexibility in painting requirements.

The metal part then passes through a five-stage washer involving the following tanks in succession: rinse, phosphate, rinse, chrome-rinse, and then to the dry-off oven. The first three of the five washer stages are heated by gas-fired immersion tubes.

The dry off oven is unique in that it obtains its heat by waste heat from the washer unit. Dry-off oven heat is thermostatically controlled, as are all heated stages of the system.

Now the part is clean and ready for painting.

First, it is sent through two Randsburg electrostatic automatic paint stages, and two manual reinforcing booths to finish certain parts that are inaccessible to automatic paint spray.

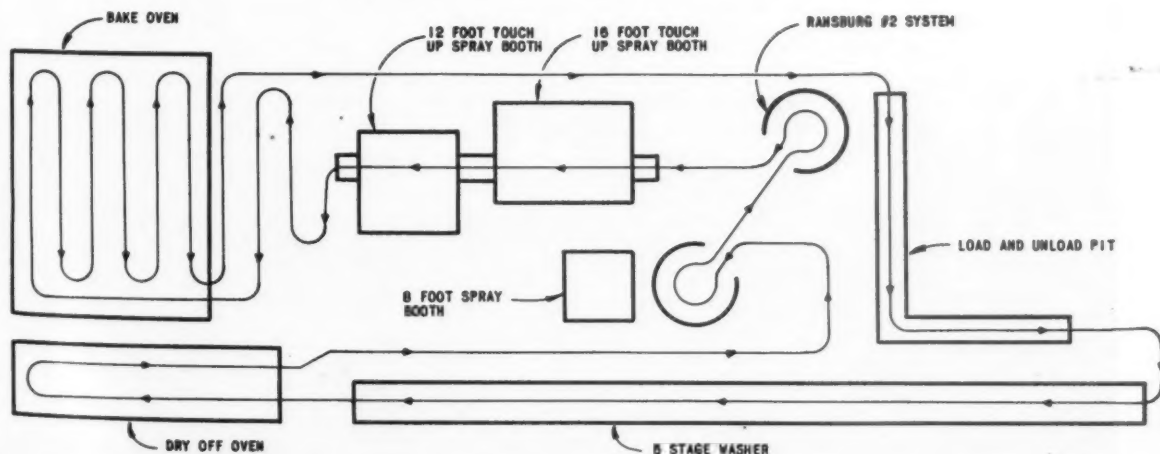
In addition, a stationary manual booth is incorporated in the system for special work. The Randsburg paint spray systems use two reciprocating spinning discs that move up and down as a controlled quantity of paint is continuously and invisibly spun off the discs to reach parts to be painted. This is under guidance of a high-potential electrostatic field that produces a painted surface having uniformity and good appearance with minimum waste.

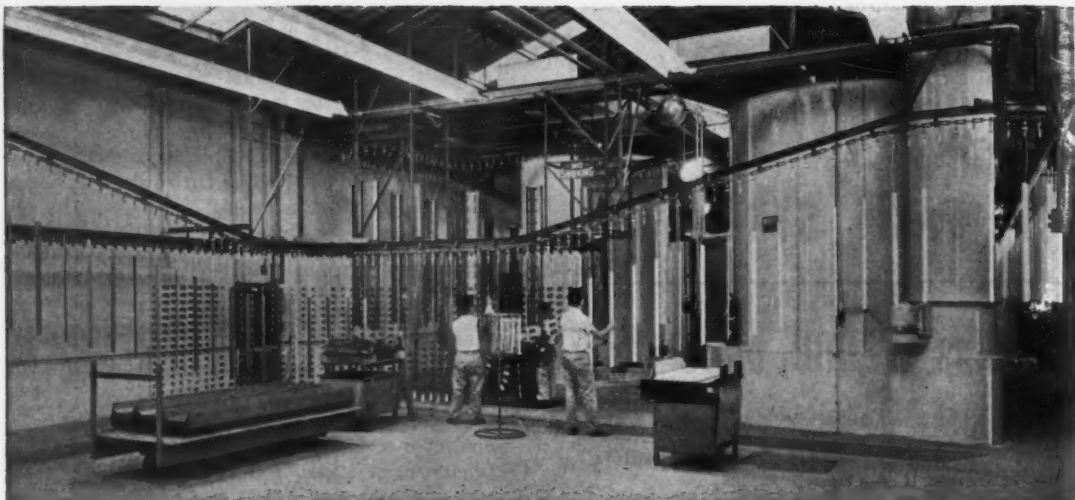
Cleanliness of the area is a vital factor in attaining a quality finish. The whole system, including the building, was designed and installed with dust control in mind.

Air is supplied to the building under positive pressure from a blower system delivering 80,000 cfm of fresh air. By keeping the building under positive internal pressure the admission of dust-laden air is minimized.

To insure optimum atmosphere for paint application, air temperature is brought to a suitable range by means of a gas heating system incorporated within the fresh-air blower room.

DIAGRAM OF PREPARATION & PAINTING LINE





GENERAL VIEW of take-off operations and put-on operations with the conveyor system. Main conveyor leads upward to right. Spray booths are in background.

After paint is applied, the part moves through a flash-off station, then travels 180 ft. through a gas-fired oven. The oven, built by J. O. Ross Engineering Corp., brings painted parts to a temperature usually ranging from 300° to 325° F.

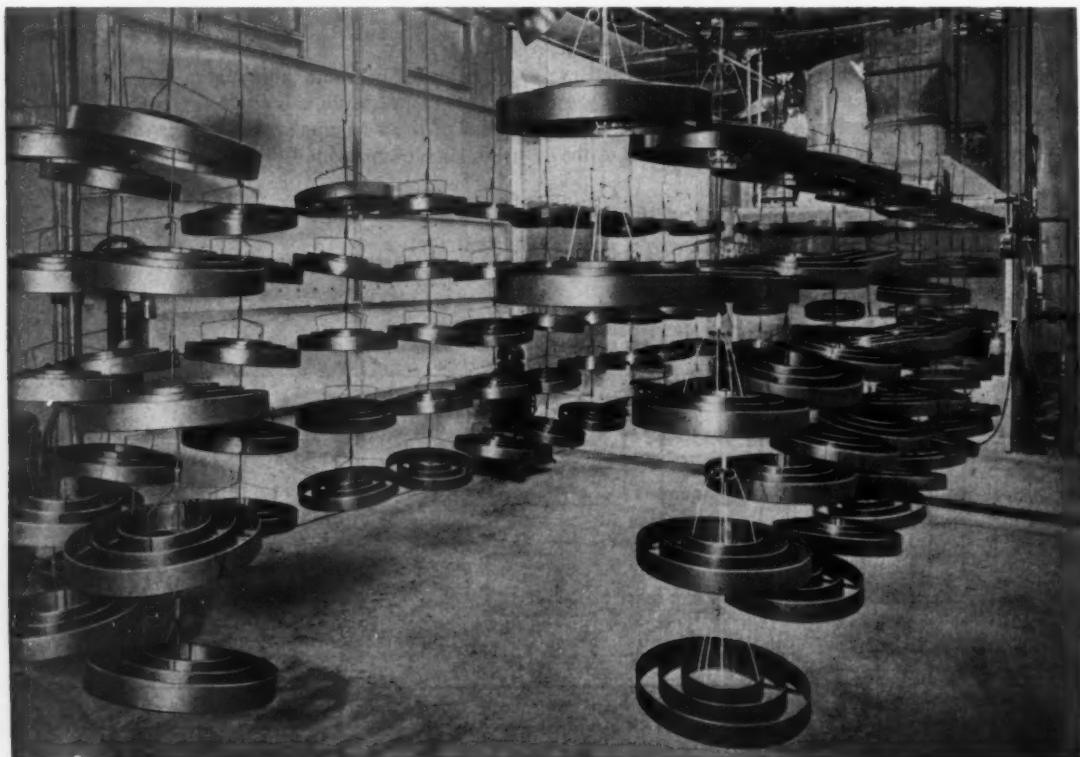
As work emerges from the bake-oven, it is sent along a 118-ft. conveyor section that acts as a cooling zone.

allowing temperature of the parts to drop sufficiently for handling.

Combustion systems are supplied by Petr-O-Fire dual fuel units. Two machines are on the washer, one on the oven, one on the air makeup system.

Average production in an eight-hour day is 25,000 sq. ft. of painted surface.

LIGHTING FIXTURES after transfer from main to auxiliary conveyor, prior to manual touchup. Manual spray booth is in background to right. At left are paint booths served by main conveyor.



LOS ANGELES IN 1960

future industrial growth

Business Outlook Conference predicts L.A. industry workforce may pass Chicago this year, be second only to New York.

PROSPECTS FOR 1960 are fairly bright. New peaks will be made in virtually all economic activity!

These were the words of Business Outlook Conference kickoff speaker Edwin B. George, director of economics, Dun & Bradstreet, Inc., as he opened an all-day session attended by more than 1000 Western businessmen at the Los Angeles Biltmore last month.

Under sponsorship of the Los Angeles Chamber of Commerce, speakers and panelists presented a com-

prehensive analysis of economic trends and made a series of predictions that supported estimates of a gross national product for 1960 that would reach the half-trillion dollar mark, or more than 7% over last year.

Panelists moderated by Dr. Neil H. Jacoby, dean of the UCLA graduate business school, focused attention on Southern California and western economy during afternoon sessions.

Panelist Bryant Essick, president, Essick Manufacturing Co., Los Angeles, predicted that we may pass Chicago this year in total Los Angeles industrial workforce to become second only to New York. Current southland manufacturing employment is at the 760,000 level, 43% of the entire western workforce.

Since much of this manufacturing activity depends on metal, Essick pointed out that the end of the steel strike insures a high level of activity during the first half 1960 to fulfill current demands and to rebuild off-the-shelf inventories.

Switching to the outlook for defense equipment industries, Charles F. Horne, vice president, Convair, Pomona, Div. General Dynamics Corp., listed statistics showing that the branch of industry termed the Aerospace group has a healthy \$12.1 billion backlog as of the third quarter of 1959.

The defense economy will remain high with a \$40.9 billion budget allotted for fiscal year 1960 and major airframe and missile procurement will get about \$10.3 billions of this amount, he said.

The Convair spokesman pointed out that California is getting 22% of the defense dollar, while in the Southland, 70% of all its activity is towards business allied with defense. About 15½% of the entire national defense industry is located here.

Currently 391,000 Californians are in defense work with 280,000 of this number in the southern half of the state.

Horne predicted that with increased complexity and



L. A. BUSINESS OUTLOOK CONFERENCE hears Dr. Neil H. Jacoby, dean of UCLA graduate business school, and panel moderator at Conference. Other panelists in picture are (left to right) Bryant Essick, A. N. Curtiss, George B. Gose, J. M. Udall, Elden Smith and P. Corrin.

expense of the more efficient weapons systems, fewer large systems will be bidden on and production runs will be limited.

He said this will result in more intense competition for the defense dollar and longer gaps between con-

a 52% increase over 1959 levels.

Industrial products, primarily automation devices for factory and office, are currently under development and include computers, data processing equipment, closed circuit TV and communications equipment.

As the use of electronic devices skyrockets, a new service activity is growing along with it, the replacement parts industry. This is receiving renewed attention, Curtiss said, since it has reached a volume of \$1.3 billion annually.

MANUFACTURING EMPLOYMENT Annual Averages 1949 & 1958

	1949	1958	% change 1949-1958	1958 % of state total
Los Angeles	375,410	701,364	86.8	57.9
Orange	6,707	27,768	314.0	2.3
METROPOLITAN LOS ANGELES	382,117	729,132	90.8	60.1
Imperial	1,272	1,407	10.6	0.1
Inyo	205	226	10.2	(X)
Kern	3,645	6,975	91.4	0.6
Kings	1,192	1,109	-7.0	(X)
Mono	25*	120*	380.0	(X)
Riverside	3,723	12,280	229.8	1.0
San Bernardino	12,369	18,810	52.1	1.7
San Diego	26,639	67,654	186.2	5.6
San Luis Obispo	420	869	106.9	(X)
Santa Barbara	2,052	3,960	93.0	0.3
Tulare	2,665	2,976	5.1	0.2
Ventura	1,986	6,626	233.6	0.5
Southern California	439,310	852,144	94.4	
Northern California	256,025	360,168	40.7	
State of California	694,335	1,212,312	74.6	
So. Calif. as a % of state	63.1	70.3		

Notes: (X)—Less than 0.1%

*—Estimate by Research Department, Los Angeles Chamber of Commerce

Source: Research and statistics section, California Department of Employment

tracts. Horne added, hopefully, that this shortcoming will be offset by vigorous commercial manufacture in the airframe industry in 1960.

In this regard, the industry can look forward to increased business in the vertical rising aircraft, helicopter, and flying platform fields, he said.

He mentioned another economic shot in the arm, the space program supported by the NASA budget of some \$300 million plus, exceeding fiscal year 1959 by \$50 millions, and using skills that are essentially the same as those required by the military in their missile programs.

Briefly, Horne concluded that missile and space business was up and sales were to remain at 1959 levels. He cautioned industrial planners about a summit-meeting on disarmament and the rapid change from manned airframes to unmanned space vehicles. His long term outlook? The west must develop new markets and products.

A sister industry to the missile-airframe complex was represented by A. N. Curtiss, general manager, West Coast Missile and Surface Radar Div., RCA.

Curtiss, representing one of the fastest growing industries in history, pointed to the new high of nearly 800 electronic manufacturers based in the west, 600 of them in California.

Taking transistor sales as the bellwether of the industry, Curtiss forecast sales of 130 million transistors,

Employment in Los Angeles and Orange Counties* Total Employment¹ Unemployment¹

Comparison Year 1940 — 1,079,000					Comparison Year 1940 — 160,000				
1957	1958r	1959	% Chg. '58-'59		1957	1958r	1959	% Chg. '58-'59	
Jan.	2,497,100	2,475,600	2,507,100	1.3	70,600	149,200	156,700	5.0	
Feb.	2,511,100	2,455,400	2,532,800	3.1	75,000	175,500	156,500	-9.3	
Mar.	2,518,000	2,444,600	2,553,200	4.4	68,000	179,200	141,700	-21.0	
Apr.	2,514,500	2,440,400	2,566,500	5.2	65,700	192,500	129,000	-33.0	
May	2,521,900	2,453,000	2,576,300	5.0	65,600	177,700	129,800	-32.6	
June	2,535,600	2,471,700	2,579,200	4.3	72,000	176,700	121,200	-31.4	
July	2,511,000	2,467,800	2,609,200	5.7	83,400	176,500	123,300	-30.1	
Aug.	2,511,600	2,483,700	2,622,300	5.6	82,900	174,200	106,700	-37.4	
Sep.	2,538,500	2,502,100	2,637,300	5.4	76,000	166,300	104,900	-37.0	
Oct.	2,534,700	2,515,400	2,641,200	5.0	78,900	147,700	99,100	-37.0	
Nov.	2,524,600	2,526,900			91,500	141,100			
Dec.	2,522,700	2,573,900			118,200	146,000			
Avg.	2,522,800	2,484,200			79,050	168,600			

Wage and Salary Workers in Manufacturing²

Comparison Year 1939 — 172,800					Comparison Year 1940 — \$28.64				
1957	1958r	1959	% Chg. '58-'59		1957	1958r	1959	% Chg. '58-'59	
Jan.	765,900	731,600	743,400	1.6	\$93.31	\$94.01	\$100.44	6.8	
Feb.	772,400	726,600	750,600	3.3	93.86	94.25	99.79	5.9	
Mar.	773,700	724,800	759,900	4.9	93.86	94.49	100.28	6.1	
Apr.	767,600	716,300	764,400	6.7	94.40	93.30	100.60	7.9	
May	765,700	711,300	760,300	6.9	92.54	95.28	101.09	6.1	
June	766,200	715,800	769,300	7.5	93.59	97.20	102.82	5.8	
July	763,300	717,400	764,600	0.3	93.32	97.20	103.07	2.6	
Aug.	766,100	727,700	782,300	7.5	92.96	98.33	102.82	4.6	
Sep.	757,300	733,000	786,400	7.3	92.68	98.74	101.45	2.7	
Oct.	749,700	737,700	785,700	6.5	92.35	98.58	101.30	2.8	
Nov.	737,200	745,900			93.56				
Dec.	722,800	750,200			94.77				
Avg.	759,000	728,200			\$93.41				

Wage and Salary Workers in Aircraft and Parts²

Comparison Year 1940 — 40,500					Comparison Year 1940 — \$31.74				
1957	1958r	1959	% Chg. '58-'59		1957	1958r	1959	% Chg. '58-'59	
Jan.	219,700	179,500	172,600	-3.8	\$101.15	\$104.49	\$109.45	4.7	
Feb.	221,700	179,500	174,400	-2.1	99.21	104.24	109.33	4.9	
Mar.	222,500	178,400	175,700	-1.5	99.10	103.57	107.42	3.7	
Apr.	222,500	177,900	176,000	-1.1	99.31	101.66	109.18	7.4	
May	220,900	176,600	174,800	-1.0	100.99	104.60	109.06	4.3	
June	218,700	174,500	174,600	0.1	103.32	105.18	112.06	6.5	
July	216,500	174,000	176,900	1.7	104.00	105.71	110.03	4.1	
Aug.	211,100	174,500	177,800	1.9	97.99	106.90	110.03	2.9	
Sep.	207,700	174,300	177,800	2.0	97.96	107.04	108.53	1.4	
Oct.	203,300	174,700	178,300	8.9	98.47	109.76	109.21	-0.5	
Nov.	196,200	173,800			100.02				
Dec.	188,800	173,500			102.01				
Avg.	212,483	175,782			\$100.20				

Wage and Salary Workers In Construction²

Comparison Year 1949 — 88,300					Comparison Year 1952 — \$88.73				
1957	1958r	1959	% Chg. '58-'59		1957	1958r	1959	% Chg. '58-'59	
Jan.	133,000	123,600	127,600	2.8	\$106.63	\$121.91	\$129.21	6.0	
Feb.	134,700	117,800	122,000	3.6	117.08	119.83	112.27	-6.4	
Mar.	135,400	116,100	129,900	11.9	114.50	111.59	130.98	17.4	
Apr.	132,100	116,100	132,600	14.2	115.27	118.62	131.73	11.1	
May	133,600	123,600	137,300	11.1	115.27	127.67	132.43	3.7	
June	136,500	126,400	136,900	8.3	116.54	128.39	133.53	4.0	
July	117,500	127,400	139,900	9.8	119.89	129.83	133.96	3.2	
Aug.	112,500	130,400	145,300	11.4	122.63	128.47	138.38	7.7	
Sep.	133,600	132,200	143,800	8.8	118.78	130.50	139.50	6.9	
Oct.	135,900	131,500	142,400	8.3	118.76				
Nov.	132,500	128,600			110.81				
Dec.	130,300	129,100			120.27				
Avg.	130,690	125,233			\$118.29				

What else lies ahead productwise?

Curtiss listed super industrial computers, world wide color TV, a maze of consumer devices, anti-missile weapons for defense and improved basic circuitry to amplify, direct and control electronic impulses.

UNUSUAL COATING

cuts underwater drag

Coating has inner layer supported by tiny rubber pillars through which viscous compound flows. Design allows freer movement through water; liquid suppresses turbulence.

EVENTUAL SPEEDS of sea-going ships up to 70 mph and potential underwater travel of more than 200 mph were forecast last month in Los Angeles during announcement of a specially designed rubber coating for boat hulls developed by Dr. Max O. Kramer, vice president of Coleman-Kramer, Inc., Los Angeles, in cooperation with the U. S. Rubber Co.

The unique coating was developed by Kramer while pondering why porpoises can thread through water with so little apparent effort. His studies of porpoise skin showed it to be about 1/16-in. thick, highly elastic and equipped with a duct system.

This allowed stabilization of the boundary layer surrounding the beast as it cut through the sea with about 90% less turbulence. Kramer's boat skin, in essence a synthetic copy of the porpoise skin, can permit boats to travel faster without increased power-plant or at current operational speeds with substantially less power.

Many components and designs have been tried in perfecting the coating. The most practical development to date is a thin layer of rubber supported by a complex of tiny rubber pillars.

Inter-connecting channels between the pillars contain a free-flowing viscous compound. This side of the skin is applied to the surface of the hull or test object while the side riding in the water is smooth.

The channels allow flexibility and the liquid provides necessary damping to suppress turbulence caused by motion in the water.

U. S. Rubber's mechanical goods division, that may produce the drag-resistant coating, plans to market it under the trademark "Lamiflo".

Not restricted to water transport alone, research studies are currently applying this principle to missiles, rockets, airframes, and piping used for liquid movement.

U. S. Rubber Co. scientists including Dr. F. W. Boggs, have worked with Dr. Kramer to develop coat-



ENERGY ABSORPTION in Lamiflo coating is checked by Dr. Boggs. Note coating sample showing tiny pillars around which a viscous fluid moves as the boat hull moves through water

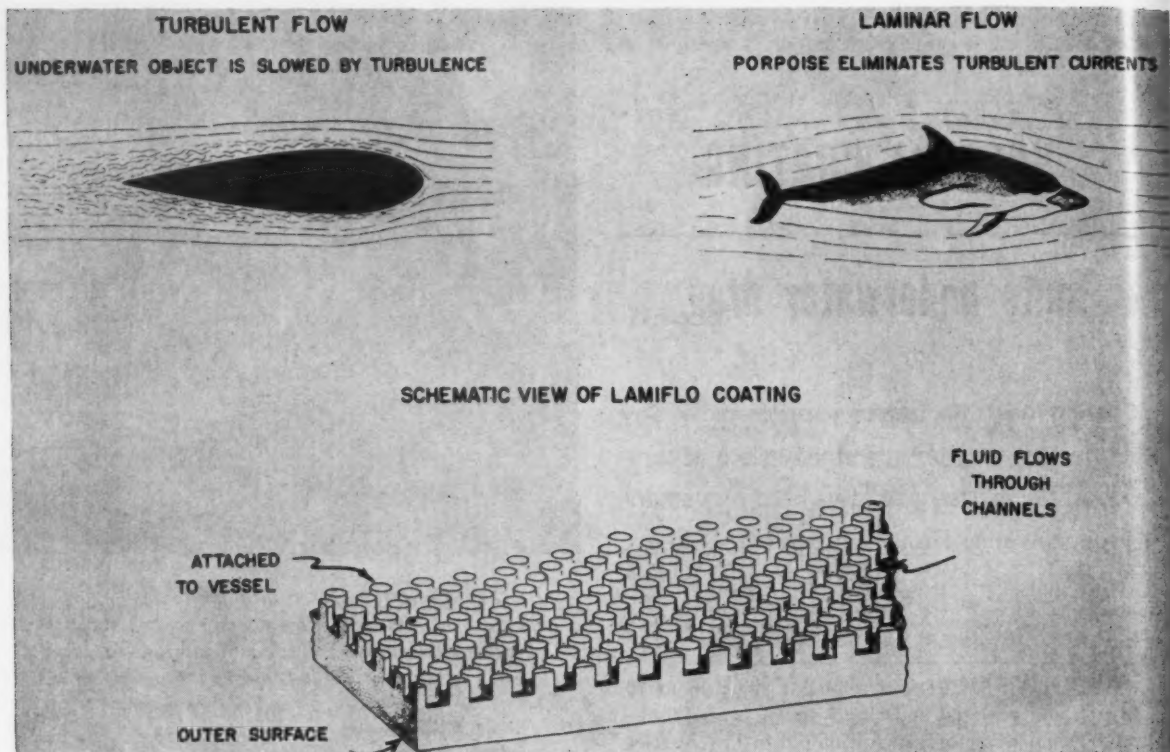
ings that have already reduced drag by 50% in water.

Project researchers report that an object being propelled through the water actually uses from 70% to 90% of its propulsive energies to overcome drag due to this turbulence created by the bulk of the object itself as it displaces water.

If this turbulence can be successfully reduced by the Lamiflo process, then anything that moves through air, water, or pipeline could probably do so at time and cost savings.

DR. MAX KRAMER, designer of the coating, makes test on Lamiflo sample.



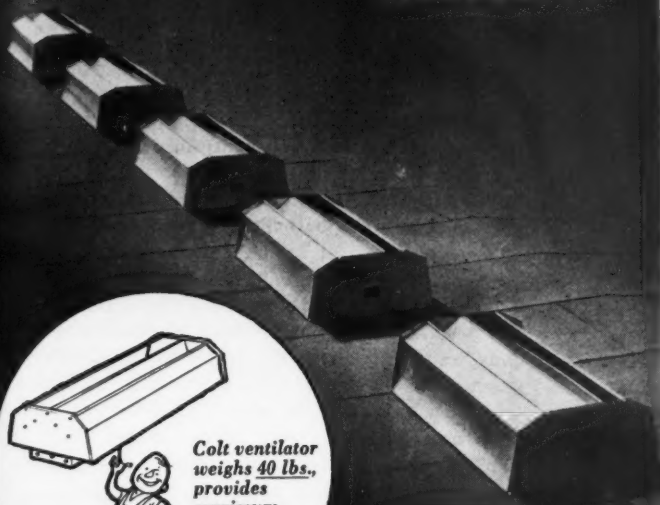


TEST DEVICE COATED with Lamiflo is fitted into place by a technician as Dr. F. W. Boggs prepares to start boat. Tests such as this one have shown coating has reduced draw by 50% in water.



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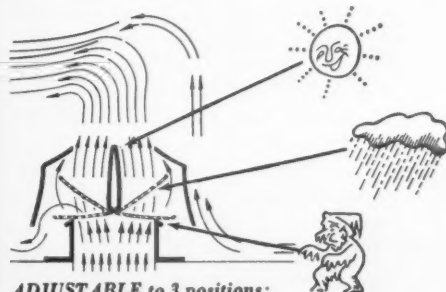
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PLEASE FILL IN

PALLETIZED DELIVERY

for bagged cement

New handling system at Riverside Cement bags product, then flattens bags for loading and automatically loads them on pallets.

A NEW SYSTEM for palletized delivery of bagged cement has proven to be a major cost reduction breakthrough for the Riverside Cement Co., Riverside, Calif. Additional advantages have been found in improved customer service. Their former cement packing and loading system caused delay in order filling, required shifting of work crews from station to station, and movement of bagged cement was via hand truck, a slow, costly process.

Material handling advantages of palletized delivery were known by Riverside Cement, but the high price of hand pallet loading proved a financial bottleneck. Customer preference for palletizing made changes necessary.

To start off, the firm, in cooperation with the St. Regis Paper Co., proceeded to modernize the pack house to facilitate loading of cement into multi-wall bags. At the same time, Lamson Corp. was developing automatic pallet loading equipment to handle multi-wall bags and expedited development of the machine for inclusion in the pack house design.

Final plant layout included two packing machines, the automatic pallet loader, an elevating bag flattener, box car loader, 380-ft. of conveyor system, and new dust collection equipment.

Improvement of warehouse facilities was next. Truck wells were filled in to floor level to augment space. Trucks could then be driven directly into the warehouse for loading by forklift from each side.

To speed loading of trucks with unpalletized cement, OH conveyors were installed to deliver sacks directly to the truck bed.

The bagging system, as supplied by St. Regis, is capable of delivering 50 sacks per minute. After sacks are filled they are discharged on a conveyor system that is capable of delivering to two of the four loading terminals simultaneously.

Sacks traveling to the Lamson pallet loader pass through a flattener that shapes the package, squares



LIFT TRUCK backs load from Lamson unit as machine lowers newly-loaded pallet to platform.

the corners and squeezes out the excess air to permit symmetrical pallet loads. This is an integral part of the system since lack of rigidity in cement must be overcome for proper loading.

The pallet loader operates at speeds of 25 sacks per minute. Loads can be built in increments of 25, 30, 35, and 40 sacks, or to suit customer needs. If the buyer has a 1½-ton capacity fork lift, a 25-sack pallet is built. A 2-ton lift can handle a 40-sack shipment.

Wooden returnable pallets are used for ease of handling with the loader and to avoid premium costs to the customer for use of expendable items. Additional savings include shorter loading and unloading times, faster order make-up, space saving through tiering of pallets, quicker inventory control, fewer breakage problems and lower clean up costs.

Rail car loading is accomplished with a flexible conveyor system capable of turning 90° for delivering sacks deep inside the car. Plans are being made by Riverside to ship palletized loads by rail also.



TRUCKS ARE LOADED from pre-palletized inventory. Loading area permits trucks to drive through without turning around, also loading from both sides.



CRANE WITH ROTATING TROLLEY SPEEDS WAREHOUSE HANDLING

Storage area for tubing used in the production of tapered roller bearings at The Timken Roller Bearing Company, Bucyrus, Ohio. A Cleveland Tramrail double-girder completely motorized crane handles the material in and out of storage and to the machine tools. The crane can travel the entire length of the department and the trolley will rotate 360 degrees, enabling the operator to turn full bundles into position required for loading machine racks.

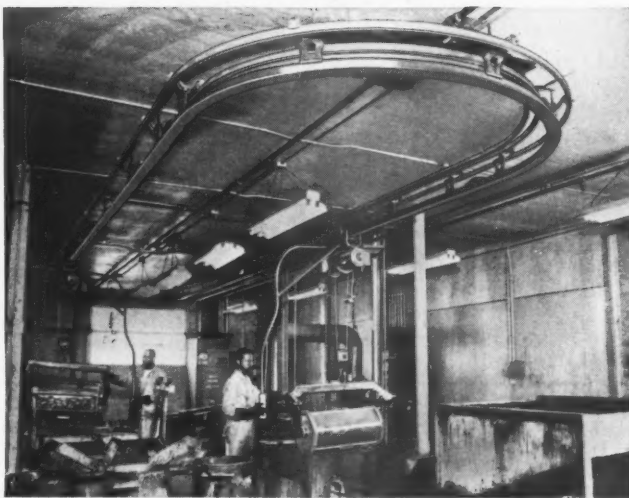
CLEVELAND TRAMRAIL USED IN MANY WAYS TO PRODUCE IMPORTANT SAVINGS

TRAMRAIL SYSTEM HANDLES VALVES THROUGH VARIOUS STEPS OF MANUFACTURE

Provides 80% Floor Space Savings

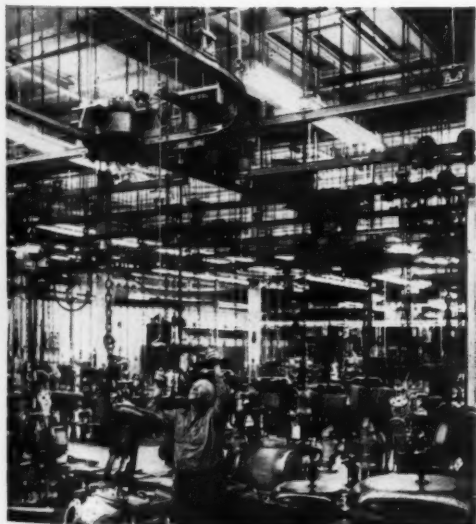
This is not a blurred picture. What makes it appear so is the vast number of chains suspended from hundreds of Cleveland Tramrail carriers which are used at the Mason-Neilan Division, Worthington Corporation, Norwood, Massachusetts, to carry valves through the various steps of manufacture. The entire system of production is dependent upon the performance of the overhead Tramrail.

A very important advantage of the Tramrail system is the large savings in floor space it makes possible. If floor type handling equipment were used, it has been estimated that about five times as much floor space would have been required.



TRAMRAIL TRACK LOOP CUTS CLEANING AND PLATING COSTS

This Cleveland Tramrail track loop at the Duro Fittings Co., Los Angeles, California, is a big factor in cutting costs and speeding parts between cleaning and plating operations. Two hand-operated carriers with electric hoists serve this work at high efficiency.



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CLEVER RACKS for aluminum products

Used for both handling and stacking; racks also nest

IN ORDER TO EXPEDITE HANDLING of their roll formed aluminum products during storage, loading for shipment and delivery to customers, Universal Molding Co., Lynwood, Calif., has developed their own specialized nesting racks to hold boxed items.

The customer, at his option, may pay for the racks on delivery and keep them to warehouse his shipment without further handling. If he desires he can simply unload the delivery and return the empty racks.

Racks are "C" shaped and fabricated from three welded sections. Each upright member is fitted with an access hole for an OH crane hook or a grab hook from a tow or sling chain.

Stackable in three, four, or more tiers, the racks provide easy movement of several dozen cartons of shapes at one time. When locked into position by weight of the load, no fasteners are needed, the racks form a ready-made storage bin.

BUILDING A THIRD TIER of racks, warehousemen lower slings holding a nine-carton unit. Note permanent use of racks in background.



HARDCOATING ALUMINUM saves weight and cost

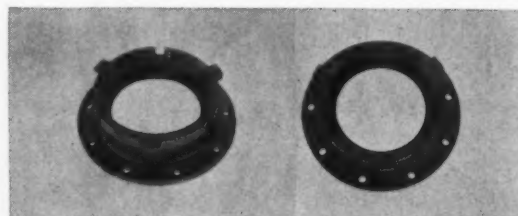
Part now made of aluminum instead of bronze

USE of Sanford Hardcoating Process for aluminum has allowed Parker Aircraft Co., Los Angeles, Calif. to make significant cost and weight savings in airborne components of a newly developed refueling system for jet aircraft.

The new ground-pressure refueling system is specifically designed to solve problems involved in fueling advance performance jet transports that carry nearly 22,000 gallons of fuel. Equipment for the new refueling system is being built both for static, hydrant-type fueling operations as well as for mobile, tank-truck installations.

Vital to this Parker-developed refueling system is the underwing adapter valve which receives the refueling nozzle. This valve must be of minimum weight and the adapter flange that couples the nozzle to the valve must have extreme wear resistance to hold up under repeated connect, disconnect actions.

Previously the adapter flange had been machined from a bronze casting but advantages gained in wear characteristics were cancelled in cost, weight penalties.



Parker engineers considered the possibility of using an adapter flange of low cost, light weight aluminum and hard coating it for abrasion resistance.

It was found that Sanfordized aluminum provided the same wear characteristics as the heavier metals including bronze and steel. The weight was cut 0.57 lbs. The new flange weighs only 0.35 lbs. as compared to the bronze flange of 0.92 lbs.

In addition, the Sanfordized flange can be produced at less cost due to reduction in price of the basic metal and in the better machining characteristics of aluminum.



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METAL CONTAINERS

assembled by adhesives

Unusual assembly method using epoxy resin high strength adhesive has a number of interesting advantages.

THE USE OF adhesive bonding to assemble metal, water-tight, light-weight shipping containers has reduced design and production costs approximately 25 percent at Zero Manufacturing Co., Burbank, Calif.

The adhesive selected by Zero Manufacturing Co. for this unique assembly method is a one-part high strength adhesive with an epoxy resin base called EC-1386 developed by the Adhesives, Coatings and Sealers Division, Minnesota Mining and Manufacturing Co., St. Paul, Minnesota.

These containers, used for the shipment, housing and storage of complex electronic instruments and systems and complicated mechanical gear, must meet rigid military specifications. Containers of many intermediate sizes and shapes are required. Supplying the entire range of large size containers would present problems of finished goods inventories. Therefore, to quickly supply high performance containers of required sizes with efficient production methods necessitated a new concept in container design.

The solution to the problem was the developing of an erector set principle which is known as the Modular Packaging System in which the entire container is assembled by adhesive bonding.

These shipping containers consist of slotted aluminum extruded frames with stressed aluminum side sheets in a tongue and groove design. The extrusions are first adhesive bonded by means of corner castings to form the framework and the sides of the container are then inserted in the extrusion grooves and adhesive bonded.

The savings resulting from the use of adhesive bonding result from simplified design and production operations. In the initial stages, complicated design considerations were not required for welding, bolting or other joining methods.

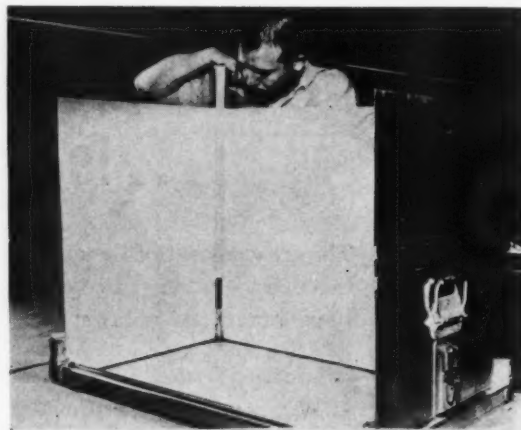
Adhesive bonding does not require the high heat necessary for welding or brazing operations which may tend to distort the container shape. Adhesives produce

continuous bonds and thus distribute stress loads evenly over the entire joined area. This eliminates local stress concentrations common with mechanical fasteners, produces joints of greater strength and rigidity and permits the use of lighter gage materials. Assembly and heavy gage extrusion frames to thin side sheets by metal fasteners or spot welding is limited by the bearing or tear strength of the thinner sheet. With structural adhesives there are no local stress concentrations at the points of attachment and the full strength of the thinnest sheet can be utilized. This factor often allows reduction of gage thickness or size which results in weight and cost savings.

Production operations were simplified because close tolerance machining of mating parts and hole drilling for rivets or bolts were not required. The 3M adhesive has void filling properties which eliminates the need for close tolerance machining. Also, the assembled containers are easy to square in the production stage because the adhesive remains malleable until it is cured.

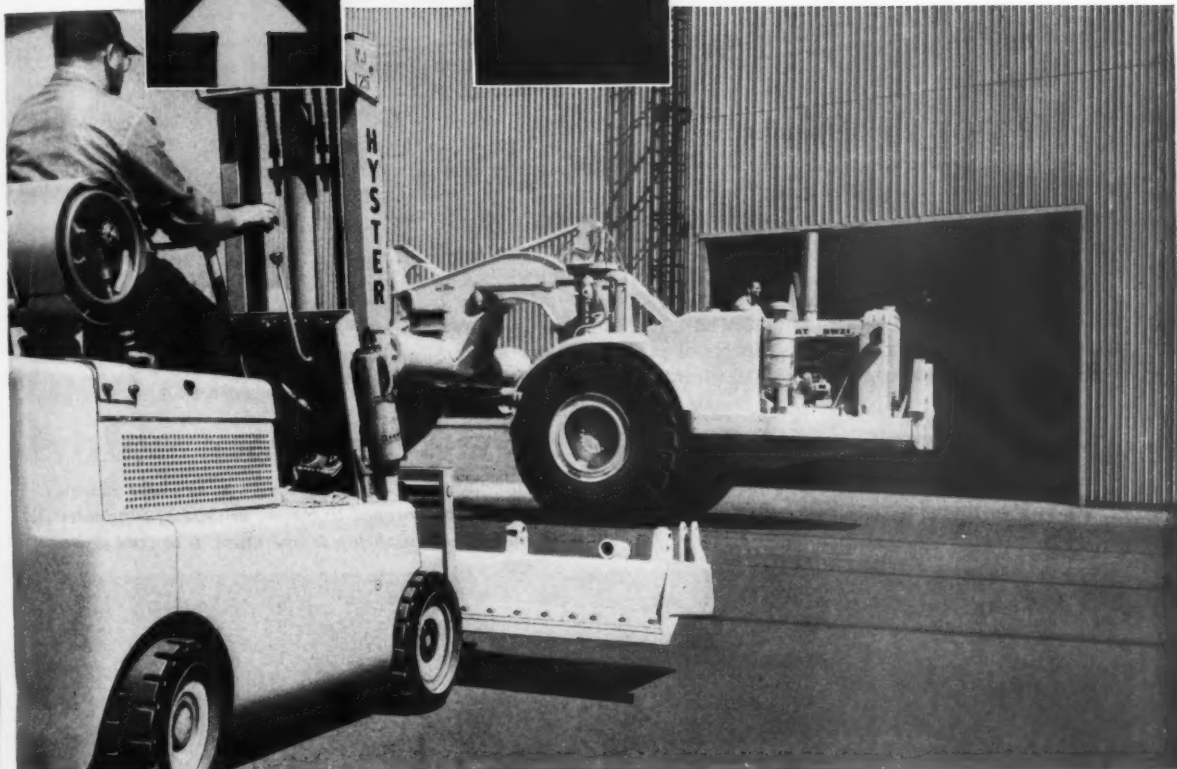
One major advantage of adhesive bonding is that adhesives automatically provide an efficient seal at all seams at the time of bonding, thus eliminating the time and cost of separate sealing or gasketing operations. This is important in this application because the shipping containers must be water-tight.

Skilled labor is not required for bonding operations which substantially reduce production costs. In this application, adhesive bonding requires only low capital investment because of the inexpensive application and bonding equipment required.



INSERTING ALUMINUM side panel sheets into adhesive filled integral grooves of the frame extrusions.

Another advantage to adhesive bonding is that if there is a necessity to disassemble the container, the entire assembly can be placed in an oven and heated to a point several hundred degrees above the 350° curing point of the adhesive. At these extreme temperatures, the adhesive will lose strength, permitting easy disassembly of the container.



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STEEL HONEYCOMB

brazed with graphite cloth

High temperature brazing process
takes only a few minutes

A HIGH TEMPERATURE brazing process, taking only a few minutes to braze stainless steel honeycomb components, has been perfected by Rohr Aircraft Corp., Chula Vista, Calif., and uses a heating element developed by National Carbon Co., Div., Union Carbide Corp.

This basic thermal element is a graphite cloth register that covers the item to be brazed as it sits in a Rohr-built brazing chamber and is capable of raising temperatures of stainless honeycomb parts from room

to brazing heat and back down to 600° F. level in as little as 9 minutes.

The average brazing cycle requiring a 1650° F. top heat and a return to 600° F. has taken about half-an-hour during the extensive test program.

Brazing is accomplished in a sealed chamber that does not require expendable tooling. Oxidation and contamination is controlled through an inert argon atmosphere.

Argon is introduced to the chamber prior to inserting the honeycomb. The panel, arriving from the lay-up room in a sealed plastic bag containing an argon atmosphere also, is placed in position in the chamber and is covered with the graphite cloth heating element. This is done after the plastic covering has been cut away.

Electrodes and thermocouples are then positioned and the chamber is closed and sealed with a series of mechanical clamps.

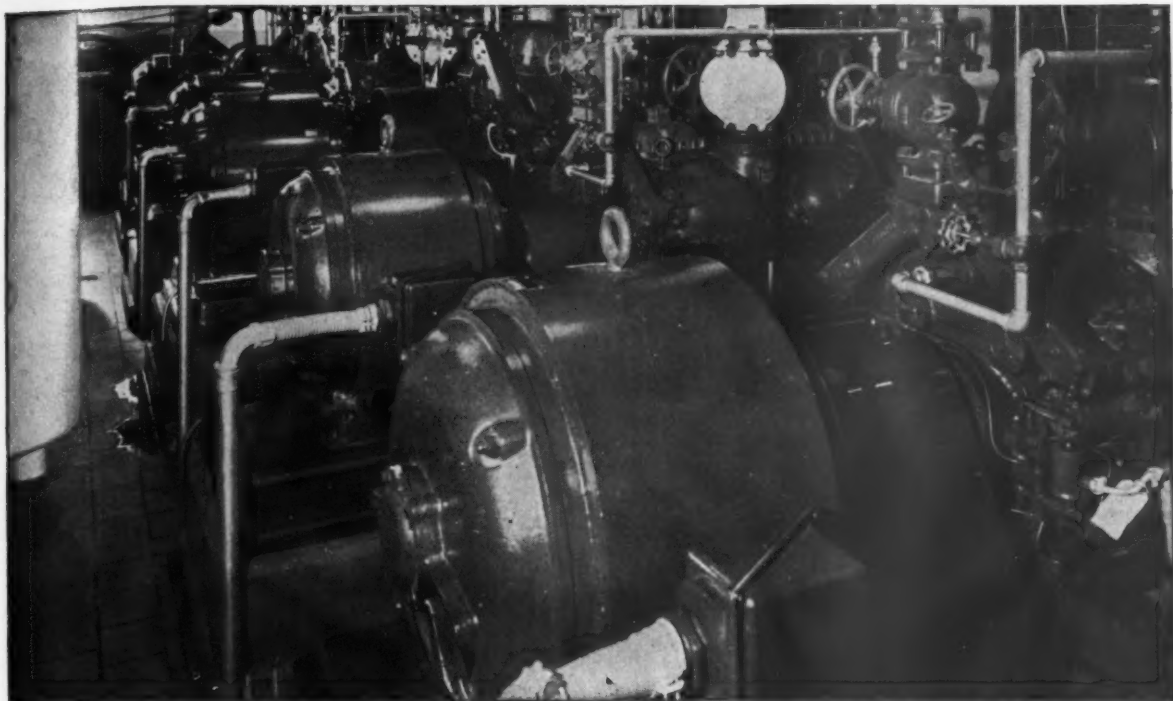
At this time the chamber is purged and flushed with argon to obtain the proper protective atmosphere, and after a final instrument check power is turned on.

The chamber itself, a rectangular steel box, sits at table height and is fitted with windows to allow technicians to check visually during heat-up and cooling cycles.

When the process is used in production, Rohr spokesmen expect one hour will be devoted to each panel, allowing time for brazing chamber build-up, purging, brazing and cooling.

PULLING ASIDE PROTECTIVE LAYER of heating element, engineers expose graphite sheet and electric cables. Man at right holds panel that has been raised to 1680 F. and dropped to 600 F. in total of 9 minutes, 3 minutes to reach top temperature, 6 to cool down.





End Voltage Drop and Line Disturbance Problems caused by starting **BIG MOTORS...**

Use Wagner Increment Motor-Starter Combinations



Type RP polyphase motor
in ratings to 500 hp with
increment type starter.

Increment starting is the easy, inexpensive way to limit the inrush of starting current in motors up to 500 horsepower. And, you do it *best* with Wagner Increment Motor-Starter Combinations... matched polyphase motors and magnetic increment starters.

They do the job efficiently by reducing current drawn from the line on each point of the starter. Line disturbances are reduced because current taken from the line is not broken during the starting period. Motors start sure and fast... reach full speed in a matter of seconds. They do the job economically, too, because Wagner combinations cost less than motors with primary resistance or auto-transformer type starters. Two more plusses: The compact, relatively lightweight starter is easy to connect, and maintenance is minimized. The motor requires only regular inspection, cleaning, and lubrication... the starter needs very little attention.

Wagner two-step motor and starter combinations are suitable for most applications. For installations where unusually low inrush of starting current is required, 3, 4, 5, or 6-step increment motor-starter combinations are available. All combinations fully meet the polyphase motor starting requirements of AEIC-EEI-NEMA. Their dependability and efficiency—their ability to get the job done—has been proved by more than 20 years of service in the field.

Why don't you investigate Wagner Increment Motor-Starter Combinations? It's possible they can save you money on your big jobs. Your Wagner Sales Engineer will help you select the combination that meets your requirements. Call him now, at the Wagner branch nearest you, or write us for Bulletins MU-128 and MU-195.

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ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

... for more details, circle No. 24 on Reader Service Postcard

WESTERN INDUSTRY/FEBRUARY 1960

51

SCRAP CONTAINER cuts chip disposal time

Solves handling of machine chips and turnings

UNLOADING OF machine shop chips and turnings for the scrap disposal dealer is often a costly process. Although weight is not a critical factor, turnings are bulky, springy, hard to compact and in the past have required grapples, magnets, cranes and other time consuming devices for unloading.

Lipsett Steel Products, Inc., Vernon, Calif., a major western scrap material handling yard, has introduced a new concept in handling this problem material.

The firm uses a fleet of trucks equipped with detachable steel containers. Instead of parking the customary scrap trailer at the customer's plant, the container is dropped off at any desired in-plant or outside point.

When full, it is reattached to the truck chassis and the turnings are hauled to the Lipsett yard and in a matter of seconds are dumped for storage and processing. No crane time is needed. Rear doors are opened and the container is tilted to discharge its load in dump-truck fashion.

The container, designed and manufactured by Borg-Warner Corp., Ingersoll Kalamazoo Division, is 17 ft., 4-in. long as compared to the ordinary trailer length



HUGE-HAUL detachable container is tipped like a dump truck to quickly unload turnings. No grapples, magnets, cranes are needed.

of 30-ft. The device, unlike the trailer, does not require licensing, tires, or insurance. These savings can be passed on to the customer.

NEW SMOOT-HOLMAN

MARK V INDUSTRO-LUX

rugged, radiant, dominant!



Certified By



Far Exceeds Requirements

Write for Complete Specifications and Performance Data.

SMOOT-HOLMAN

COMPANY • INGLEWOOD, CALIFORNIA

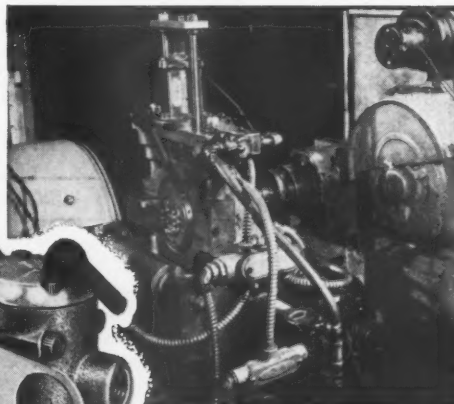


- 1960 design backed by 40 years of industrial lighting fixture experience.
- *Best looking industrial fluorescent fixture available today!
- *Five die-formed ribs provide maximum rigidity, straight rows!
- *New reflector aligner clips prevent light leaks between fixtures in continuous runs!
- *Proper light distribution. Computer designed!
- Why settle for less when the best costs no more?

... for more details, circle No. 25 on Reader Service Postcard
WESTERN INDUSTRY/FEBRUARY 1960

with the

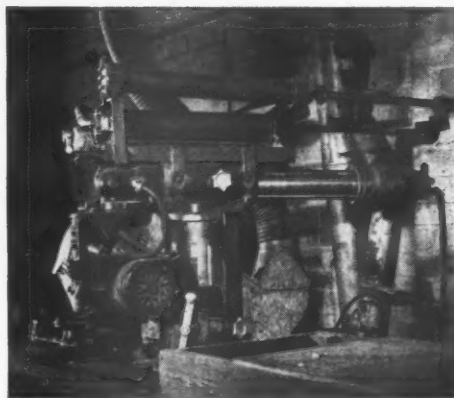
BELLOWS AIR MOTOR®



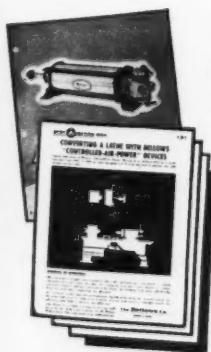
Two Bellows Air Motors move the fixture in this boring machine conversion at Parkway Manufacturing Co., Pasadena, Calif.

**...you can build special machines
...or modernize existing machines
at low cost and quickly!**

With parts normally available in every tool room, plus one or more Bellows Air Motors, and a little creative ingenuity, you can "spot modernize" scores of operations whose high cost whittles away at profits. The few illustrated here are typical of hundreds we can show you. The chances are good that no matter what you make, nor how you make it, this versatile air cylinder, with its built-in electrically controlled valve, can lend a mighty important helping hand to your cost reduction program.



Actuated by four interlocked Bellows Air Motors, this shop-built machine at Utility Cabinet Co., Los Angeles, performs operations which formerly required 4 men and 4 separate machines.



THESE BROCHURES MAY LEAD TO IMPORTANT SAVINGS IN YOUR PLANT

You're almost certain to get at least one new cost-cutting idea from these brochures. Bulletin BM-25 describes fully the Bellows Air Motor, illustrates and tells about many actual installations. "Spot-A-Motion Idea" File gives you diagrams, complete information and equipment lists which will enable your own men to automate scores of operations, quickly and inexpensively. For your free copies, write Dept. WI-260, Bellows-Valvair Corp. of Calif., 926 Western Ave., Glendale 1, Calif.

676C-2



Equipping the turret slide and cross slide of this turret lathe with Bellows Air Motors boosted production 20%, reduced spoilage and increased tool life at Minneapolis-Honeywell, Los Angeles.

Bellows-Valvair Corp.

OF CALIFORNIA

926 Western Ave.—Glendale 1, Calif.

WESTERN INDUSTRY/FEBRUARY 1960

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HELPFUL LITERATURE

FOR THE WEST'S PLANT OPERATING EXECUTIVES

FOR YOUR FREE COPY

CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, P. 69

LP-GAS FUELED LIFT TRUCKS

Brochure describes line of lift trucks available with LP-Gas fuel systems as optional equipment. The lift trucks have from a 2,000 through 40,000 pounds capacity. Folder includes illustration of a typical LP-Gas fuel system installation, explaining components and operation. Specific advantages of the LP-Gas fueling for lift trucks are outlined. *Hyster Co.*

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ONE-DAY INVENTORY

Booklet lists 12 steps to an accurate inventory designed to take the work out of physical inventory. Outlines fast, effective and economical tag inventory control system that has been tested over a period of years by large and small companies in the automotive, aircraft, electrical appliance and farm equipment industries and is described as applicable to any industry. *Tag Manufacturers Institute.*

... FOR YOUR COPY, CIRCLE NO. 101

AIDS TO BETTER COILING

Special 16-page manual outlines the basic factors and variables involved in forming nickel-chromium resistance wire into helically coiled electric heating elements. Detailed discussion of effects of work-hardening, wire temper, coiling tension and related variables. Describes hand coiling operations. Includes chart for diagnosing and correcting causes of defective coil production. *Hoskin Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 102

LOW-COST PACKAGING

Folder in color describes new machinery for packaging in polyethylene or polyester film for transparent display of hardware, foods, liquids, powders and granulated products. Contains schematic of the fully automatic, heat sealing and transparent packaging machine. *Rimco Mfg. Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 103

GAS BURNERS

Specification sheet provides complete information on gas burners. Includes size and operation specifications on the gun-heat, contractor, tele-tube and spread heat series of burners, along with photos of the different flame patterns produced by each burner. Contains accurate dimensional drawings and performance charts. *Barber Mfg. Co.*

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NEW INDUSTRIAL CATALOG

A complete list of hose types, fittings, adapters, self-sealing couplings and items such as support clamps and protective sleeves are contained in this newly released catalog. Contains up-to-date specifications on products for use on general industrial applications such as plant machinery, mobile equipment, oil field machinery, and stationary power plants. A hose selector chart is included. *Aeroquip Corp.*

... FOR YOUR COPY, CIRCLE NO. 105

TWO-MICRON FLUID FILTER

Catalog sheet describes a two-micron fluid filter combination for hydraulic fluids, fuels, lubricating oils, air, gases and solvents designed for missile and aircraft support equipment, precision industrial lab and process applications. Contains flow rate curves and dimensional line drawings, also a detailed description and full specifications of the unit. *Bendix Filter Div., Bendix Aviation Corp.*

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HIGH RESPONSE MOTOR

Fact sheet about new line of high-response d-c. motors in sizes from 1/4 through 1 hp. Included are a list of features, dimensions, characteristics and typical applications for the new motors which provide fast response in industrial applications requiring rapid starts, stops and reversals. *Reliance Electric and Engineering Co.*

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ELECTRIC TOOLS CATALOG

Illustrated 72-page catalog of electric tools for production, maintenance and construction. Contains full technical data on line of drills, drill chucks, hole saws, screwdrivers, wrench kits, polishers, belt sanders, grinders, trimmers, shapers, routers, bits and cutters, jig saws, die grinders, grinding wheels, hammers, vacuum cleaners and accessories. *Black & Decker Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 108

IMMERSION HEATERS

Folder describes translucent fused quartz immersion heaters for acid solutions, its features, application, dimensions and wattage. Also steel, copper and stainless steel immersion heaters for alkaline, water and oil solutions. Features and applications of this multi-blade type are included, giving dimensions and also wattage for one, two and three blades. *Glo-Quartz Elec. Heater Co., Inc.*

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FLAME-CUTTING MACHINE

Eight-page catalog discusses in detail the design, construction and operation of the latest addition to line of flame-cutting machines. Of pantograph design, the new machine is described as suitable for straight line and shape cutting on eight-foot steel plate used in medium duty production. Illustrated, it explains the principal features. *Air Reduction Pacific Co., Div. of Air Reduction Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 110

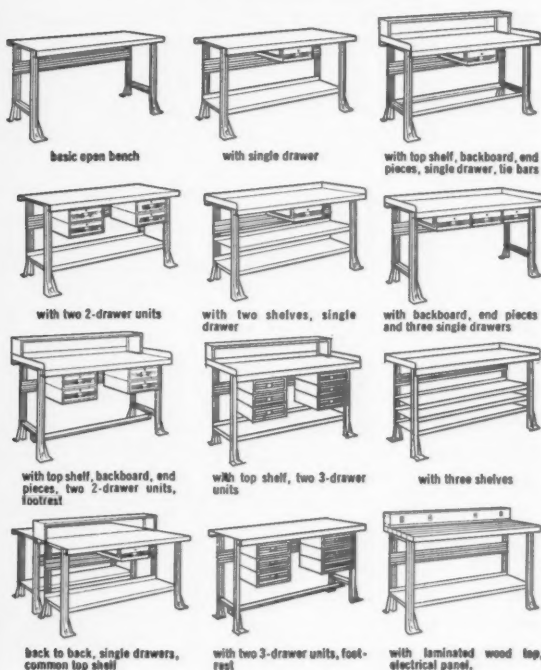
PROPERTY CONTROL PROGRAM

The growing importance of property control is stressed in 16-page booklet which outlines a five-step plan for organizing a property control system and putting it into action. Discusses the plan, assignment of responsibility and lists eight benefits resulting from an efficient program. *Metalcraft Inc.*

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 in standard units



Only Hallowell offers such a variety of lengths, widths, tops, heights, and so many accessories. Best of all, rugged Hallowell units can be tailored to your needs *immediately*, from stock! Specify Hallowell Benches for complete adaptability now . . . and for years to come.

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LITERATURE ADVERTISED IN THIS ISSUE

Floor plate. Bends easily for fabrication. Super diamond pattern. *Alan Wood Steel Co.*

Page 47 Circle No. 22

Steel building data on economy, quality when tailored to an industry. *Armco Drainage & Metal Products.*

Page 27 Circle No. 17

Miniature air cylinders, compact and easily installed. *Airmatic Valve Inc.*

Page 79 Circle No. 48

Special attachments for power fork lift trucks. *Automatic Transportation Company.*

Page 13 Circle No. 9

Select-A-Spede drive for precise control. *Louis Allis.*

Page 57 Circle No. 28

Air motors. How to automate operations quickly, inexpensively. *Bellows-Valvair Corporation.*

Page 53 Circle No. 26

Overhead conveyor system. Engineering and data booklet. *Cleveland Tramrail.*

Page 45 Circle No. 21

Fire prevention in industrial buildings. *Colt Ventilation of America, Inc.*

Page 43 Circle No. 20

PAYLOADER models, attachments, that increase production. *The Frank G. Hough Co.*

Page 83 Circle No. 51

Vibrating equipment applications, technical data. *The Jeffery Manufacturing Company.*

Page 28 Circle No. 18

Waterproofing problem. Solved in industrial products manual. *The Flintkote Company, Pioneer Div.*

Page 62 Circle No. 33

Wheels & Casters that swivel and roll. *Darnell Corporation, Ltd.*

Page 84 Circle No. 52

Stretcher-sealer specifications. Only one tool. *A. J. Gerrard & Co.*

Page 91 Circle No. 60

Strapping, material handling products handbook. *A. J. Gerrard & Co.*

Page 91 Circle No. 72

Illumination levels recommended for industrial establishments. *Pacific Gas & Electric Company.*

Page 15 Circle No. 10

Universal steam trap to 250 PSI in Unitrap bulletin. *Perfecting Service Company.*

Page 74 Circle No. 39

Pliers, wrenches, hand tools in comprehensive catalog. *Snap-On-Tools.*

Page 93 Circle No. 62

Fluorescent lighting fixture. Specifications, performance data. *Smoot-Holman Company.*

Page 52 Circle No. 25

Standard bench units with built-to-order performance. *Columbia-Hallowell Division, SPS.*

Page 55 Circle No. 27

Socket screws, stronger in head, thread. *Industrial Fastener Division, SPS.*

Page 11 Circle No. 8

Conveyor units. Standard stock cuts time, costs. *Standard Conveyor Co.*

Page 59 Circle No. 30

Handling case studies. How companies have cut costs. *Towmotor Corp.*

Page 3 Circle No. 2

Increment motor starter combinations end voltage drop. *Wagner Electric Corporation.*

Page 51 Circle No. 24

4-D Wrought iron, with corrosion resistance. *A. M. Byers Company.*

Page 69-70 Circle No. 68

BUILDING YOUR OWN BRIDGES

Photos, drawings and descriptions of complete line of jib cranes and crane bridges with capacities ranging from ½ ton through 50 tons; spans through 60 ft.; models including top running and underhung types, with hand or electrically operated bridge drives. Describes crane bridges that can be purchased in build-it-yourself kit form for firms having manpower and facilities. *Manning, Maxwell & Moore, Inc.*

... FOR YOUR COPY, CIRCLE NO. 112

DATA FOR AIR SAFETY

The use of a new high-speed translator and editor system for air safety studies is described in this illustrated brochure. Discusses system which edits data such as that resulting from aircraft structural studies, and compresses it into useful digital data for introduction into a computer. The bulletin includes a schematic of the entire system. *Consolidated Systems Corp., sub. of Consolidated Electrodynamics Corp.*

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ROCKET FUEL COMBINATIONS

Performance data for 12 possible rocket propellant combinations, each involving the use of concentrated hydrogen peroxide, are set forth in this handy wall chart. For each fuel combination, the maximum specific impulse at sea level, maximum specific impulse at sea level times the density, maximum specific impulse in vacuum, and maximum specific impulse in vacuum times the density, have been machine-calculated during the past year, using the latest thermo-chemical data available. *Becco Chemical Div., Food Machinery and Chemical Corp.*

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HYDROCARBON DETECTOR

Brochure describes a self-contained portable instrument for rapid measurement of total organically bonded carbons in atmosphere or gases. Based upon the flame ionization detector recently developed for gas chromatography, applications include measurement of unburned hydrocarbons in automotive exhaust gases and atmosphere monitoring in air pollution or lower explosive limits in industry. *Perkins-Elmer Corp.*

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WEIGHING SYSTEMS

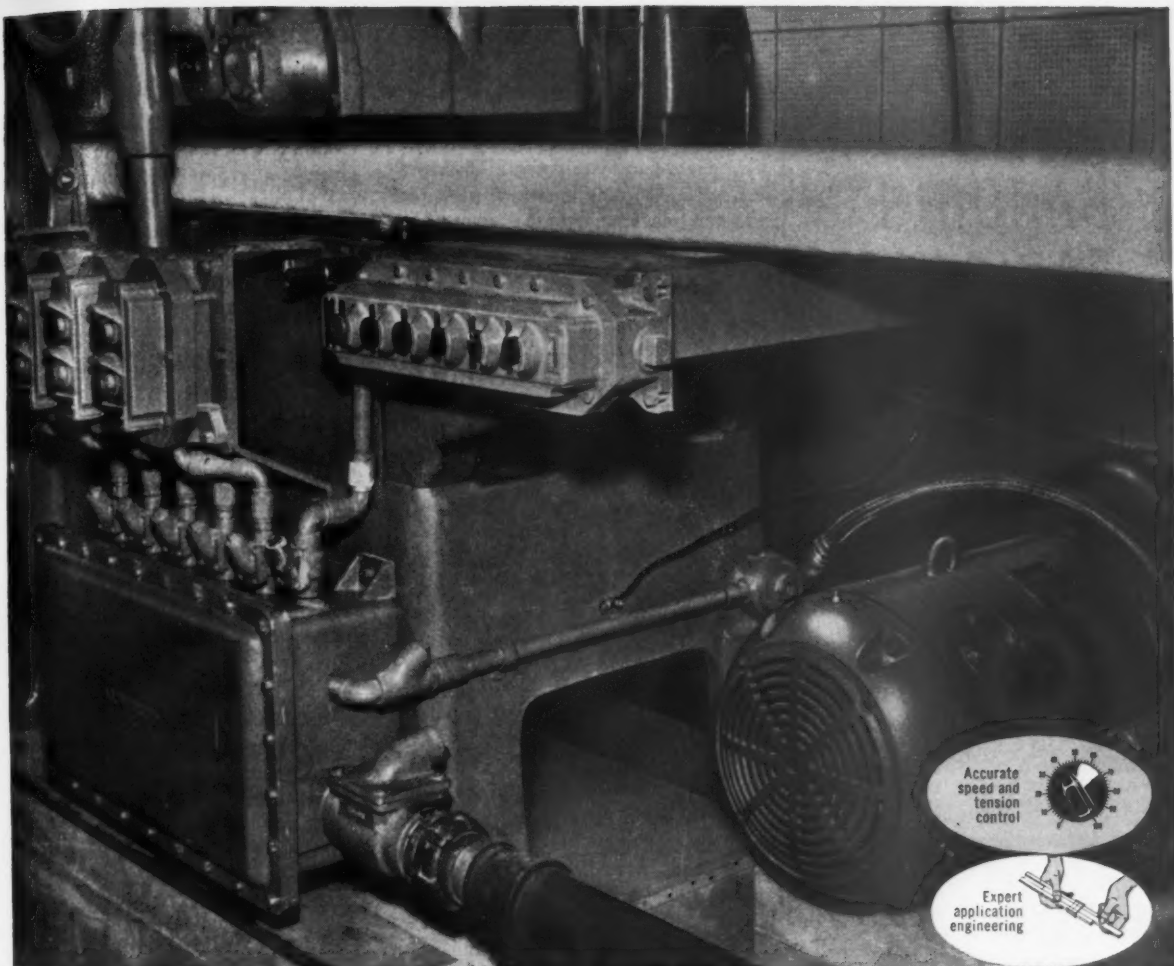
Brochure illustrates and describes weighing systems for heavy duty applications such as motor truck scales, railroad track scales, automatic batching, check weight scales, tank or hopper scales and crane hook scales. Advantages of the system, which is available for installations involving 500 lbs. to hundreds of tons, are outlined. Detailed drawings and photographs graphically describe the actual operation of the firm's system. *Howe Scale Co.*

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PROCESS INDUSTRIES EQUIPMENT

Two-color bulletin describes equipment for the process industries used for pneumatic conveying of dry granular and pulverized materials; plant air supply and vacuum service; and handling of combustion products. Operating principles are explained and photographs show typical installations. Includes photographs, drawings, illustrations and tables of dimensions and capacities of equipment. *Fuller Co., Subsidiary of General American Transportation Corp.*

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Pays for itself every 16 days!

Louis Allis Select-A-Spede® drive controls plastic-foam extrusion process — eliminates excess waste

How many pieces of equipment do you have that pay for themselves in 16 working days? That's the type of return the above Louis Allis Select-A-Spede drive brings through precise speed and tension control for continuous extrusion of plastic-foam "logs."

The old way was hit and miss — and prohibitively costly because there was no way to regulate "log" dimensions. Excessive cutting and trimming slowed down production — more material was wasted than sold — costs kited.

With Select-A-Spede, every foot of "log" comes out of the extruder in pre-set height, width, density, and weight. Only the tough outer hide has to be

trimmed off — none of the salable material winds up on the cutting room floor.

Select-A-Spede can boost your production, improve quality, and cut costs whether you're processing delicate paper tissue or wire cable — whether it controls individual drives or precision-matched multi-motor systems. Sized from ½ to 200 hp, Select-A-Spede runs on A.C. power, but furnishes precise, stepless D.C. control of speed and tension.

For complete information — or expert application help — contact your local Louis Allis District Office. Ask for Bulletin No. 2000. Or write the Louis Allis Co., 438 E. Stewart Street, Milwaukee 1, Wisconsin.

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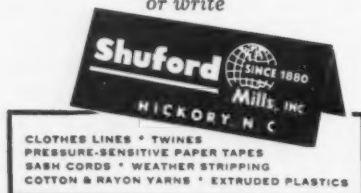
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58

ELECTROSLAG WELDING

Manual describes new automatic welding machine that can weld heavy steel sections up to 10 ins. thick at least six times faster than automatic submerged arc equipment. Discusses electroslag welding on which principle the new machine is based, giving history and applications of the vertical welding technique. Contains diagrams, photos, and complete technical data on the new equipment. *Arcos Corp.*

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WELDING ACCESSORIES

New 16-page arc welding supply catalog gives information on complete line of arc welding accessories and supplies including: headshields, grinding shields, goggles, cleaning tools, electrode holders, cable connectors, ground clamps, work holding clamps, welding cable, protective clothing, welding gloves and miscellaneous equipment. *Hobart Brothers Co.*

... FOR YOUR COPY, CIRCLE NO. 119

BORING MILL SELECTION

How to select a boring mill to fit specific requirements is explained in this brochure. The 6-pager goes into detail in explaining the proper selection method, containing more than 27 diagrams and pictures to graphically illustrate the story. Also describes stock of versatile machines ranging from 2" to 4" spindles and distances of supports from 48" to 240". *S&S Machinery Co.*

... FOR YOUR COPY CIRCLE NO. 120

GAS WELDING HAND TORCHES

New products and improvements included in 36-page catalog on line of gas welding and cutting hand torches. General descriptions, features, specifications and photographs of torches, outfits, tips and accessories. Includes new general purpose welding torch with stainless steel head and fixed flow valves. *Air Reduction Pacific Co., Div. of Air Reduction Co., Inc.*

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GLASSBLOWING BOOKLET

Step-by-step photographic story of the glassblowing art is told in this 28-page brochure. The manufacture of a cylinder is told in 24 pictures. Includes a cost comparison table and a seven-step experiment for evaluating laboratory glassware. Gives background on the discovery of glass, the raw materials utilized in making glass and its uses. *Doerr Glass Co.*

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ALUMINUM TOOLING PLATE

Catalog and manual devoted to direct chilled aluminum tooling plate and its uses as a tooling material. Outlines information for the tool engineer concerning mechanical properties, physical properties, chemical composition and standard plate sizes. Lists pointers on machining the fine grain aluminum alloy; discusses the direct-chilling process and applications. *Pioneer Aluminum Inc.*

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SUPER-STRENGTH STORAGE RACKS

Bulletin describes a new type of storage rack made of high carbon rail steel. Features discussed include dual-angle construction for lighter weight, positive-locking for safe, easy erection and adjustability. The racks are designed for pallet, bulk, drum, die, drive-in, gravity, skid, coil and bar storage. Rack measurements and diagrams are included. *Met-Fab, Inc.*

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DEHYDRATION UNITS

Bulletin gives full information on package units which reduce moisture content of gases or liquids to very low levels. Gives essentials of unit performance and includes a selection chart for the dehydration units showing which types are suitable for gas drying, liquid drying, oil removal, intermittent drying, continuous drying, low dewpoints, medium dewpoints. *J. F. Pritchard & Co.*

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IDEAS FOR DIE PROTECTION

Practical ways for protecting expensive machine tools and dies with precision switches are described in a series of five sheets. Each sheet pictures and describes how a precision switch can be incorporated into the design of a die to insure correct and safe operation. Cross-sectional diagrams and construction details are included. *Micro Switch, Div. of Minneapolis-Honeywell Regulator Co.*

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SOIL TESTING EQUIPMENT

New 316-page catalog describes over 3,400 different items ranging from a small pocket-sized soil penetrometer to completely equipped mobile labs and nuclear testing equipment. Some 1,500 illustrations with sections on equipment for testing soils, concrete, aggregate, bituminous materials, mobile labs, general lab, drilling and sampling equipment. Listings include all accessory items. *Soiltest, Inc.*

... FOR YOUR COPY, CIRCLE NO. 127

WESTERN INDUSTRY/FEBRUARY 1960

METAL PROCESSING EQUIPMENT

Brochure describing range of machines, materials and manpower services for metal processing. Metal cleaning, coating and lubricating compounds covered include metal and aluminum cleaners, etchants, and brighteners, descaling and pickling compounds, phosphatizing agents, pre-lubricant coatings, drawing compounds, deep drawing lubricants, paint strippers and strippable vinyl coatings. *Pennsalt Chemical Corp.*

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"O" RING ENGINEERING

Handbook for the design engineer incorporating the latest "O" ring design data per MIL-P-5514C revised. The 170-page book includes new sizes and cross reference tables on universal dash numbering standard ARP568 along with detailed compound information pertaining to latest synthetic rubbers. Illustrated book also includes fluid media and "O" ring friction charts. *Robert B. Porter Co., Distrib. Parker Seal Co.*

... FOR YOUR COPY, CIRCLE NO. 129

ELECTRIC MOTOR CONTROLS

New illustrated, color catalog provides a condensed listing of general products. Special quick selector charts for magnetic and manual starters give hp, motor speed, heater size and ampere ratings and enclosure choices. The 72-page catalog contains descriptive copy, design data, stocking information and complete ordering instructions for motor control products and accessories. *Furnas Electric Co.*

... FOR YOUR COPY, CIRCLE NO. 130

GAS-POWERED FORK TRUCKS

Bulletins describe five new fork trucks designed especially for heavy-duty, featuring balanced design for top efficiency, maneuverability, speed and operation. The new four-page bulletins describe and illustrate in detail these vehicles in 2,000, 3,000, 4,000, 5,000 and 6,000 lb. capacities. The trucks offer standard full capacity lifts to 144". *Otis Elevator Co., Baker Industrial Trucks Div.*

... FOR YOUR COPY, CIRCLE NO. 131

VERSATILE LIBRARY SHELVING

Colorful modern products for the library are set forth in 10-page bulletin which illustrates in color library shelving and other products that take advantage of finishes designed to blend. Describes open and closed type shelving, counter-height shelving and accessories, single tier block stacks and multi-tier book stacks. *Deluxe Metal Products Co.*

... FOR YOUR COPY, CIRCLE NO. 132

Multi-plant conveyor conversion problem solved with Standard Conveyor stock units

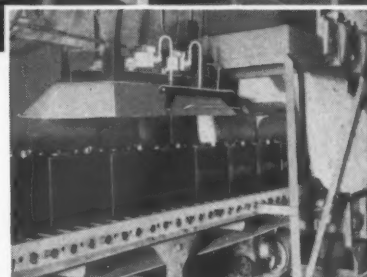


Gould-National makes full conversion in 90 days

Gould-National Batteries, Inc., makes batteries for hundreds of sales organizations, each having its own color combinations in trade marks and brand names, some requiring as many as three distinct shades. And Gould-National, to insure distribution of fresh batteries everywhere in the country, manufactures in 16 strategically located plants throughout the United States.

Battery manufacture is a highly standardized, mass-production operation. Economical application of painted multiple colors on the cases posed real problems in methods and equipment. The conversion at Gould-National required equipping 16 plants simultaneously with painting equipment and conveying systems coordinated with existing production lines.

Methods engineers at Gould-National made the multi-plant conversion in the record time of 90 days . . . using Standard Conveyor stock units, including Handidrive power unit, with big savings in cost. And what do these engineers say about Standard Conveyor? "Best possible method for our type of operation!"



Illustrated are scenes from the St. Paul plant of Gould-National. Line was designed to produce 3,000 multi-colored batteries in 50 different sizes and colors per day.

When you have a materials-handling problem, call Standard — more than 50 years of conveyor engineering experience. Standard Conveyor Company, General Office: North St. Paul 9, Minnesota.



Call the Standard engineer listed in your classified phone directory or write direct for Bulletin 309 — address Dept. H-2.

SEATTLE: Russel G. Daley, 502 First Ave. So.
SAN FRANCISCO: 840 Harrison St.

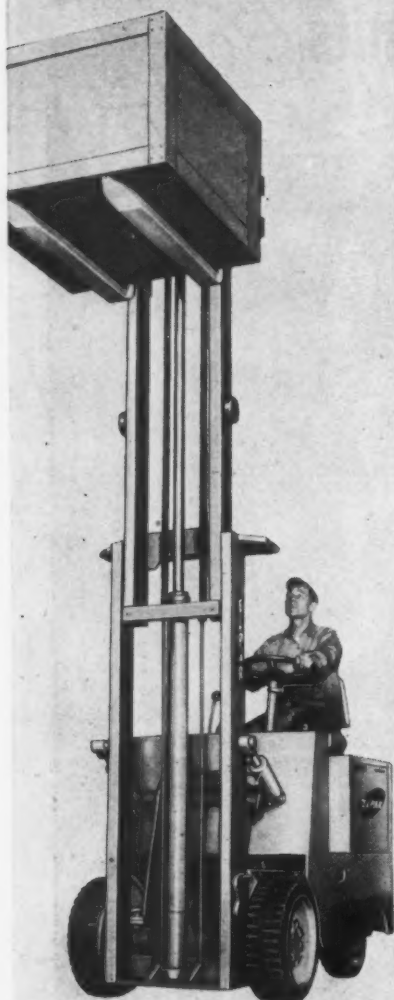


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CONVEYORS

• PORTLAND: 1115 N.W. Gilson St.
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ACRO-SMOOTH



Slashes Truck Maintenance 55%

- A new concept in truck design . . . with step-less speed control . . . demountable electrical and hydraulic controls . . . easier service accessibility . . . plus, a host of other important features that can halve your maintenance. Eliminate accidents . . . increase work output with ELPAR's new "Acro-Smooth", 4,000, 5,000, 6,000 and 7,000 lbs. capacity.

Write for Complete Details Today!

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ELECTRIC TRUCKS ELECTRIC COMPANY

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60

COLD HEADING COPPER

Reprint on economy and methods tells how copper alloys are cold headed into many shapes and the unlimited potential offered when cold heading is used with such secondary operations as slotting, drilling and tapping. Shows advantages of cold heading a particular small part or fastener that may have been produced by machining method. Check list aids in proper selection of the copper alloy. *John Hassall, Inc.*

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MOBILE LOADING RAMP

Engineering bulletin details the development and expansion of line of mobile loading ramps into an integrated system of ground level loading for plant-wide shipping and receiving. Typical problems illustrated include ground level plants, plants with limited dock facilities, scattered buildings with one central dock area, production line purchase parts feeding and away-from-plant operations. *Magline Inc.*

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ELECTRIC TRUCK

Brochure describes a unique speed control used on electric truck specially designed to give the operator smooth speed control for safety and longer vehicle life. Includes full specifications for the 4,000-lb. capacity truck, along with diagrams, photographs and a detailed analysis of each main working part of the vehicle. One section illustrates the operation of the speed control. *Elwell-Parker Elec. Co.*

... FOR YOUR COPY, CIRCLE NO. 135

MULTI-RANGE SPEED RECORDER

Data on application, features, principles of operation, and specifications of new multi-range strip-chart speed recorders. Material-processing applications related to the paper, steel, textile, rubber and other industries are described. Bulletin includes application diagrams, a schematic of the expanded scale speed recorder and a description of accessories available. *General Electric Co.*

... FOR YOUR COPY, CIRCLE NO. 136

MOVING METAL

How moving metal reduces parts cost is subject of this 24-page bulletin. Describes cost saving metal components for construction and fabricated products, machinery and equipment, transportation equipment, and missiles and rockets; illustrates with over 50 case histories how money has been saved, upset forging and rotoforming. *Commercial Shearing & Stamping Co.*

... FOR YOUR COPY, CIRCLE NO. 137

JOINING ALUMINUM

Illustrated 32-page booklet, Mechanical Joining of Aluminum, discusses the best ways to join aluminum parts to itself and other materials. Covers fastening procedures involving nails and pins, metal stitching, mechanically formed joints, and a miscellaneous variety of fasteners designed specifically for architectural applications. The booklet contains charts and diagrams as well as photographs. *Reynolds Metals Co.*

... FOR YOUR COPY, CIRCLE NO. 138

SWITCH CONTROL CATALOG

56-page catalog lists mercury switch equipped controls for single stage, two-stage and differential pressures, single-stage and two-stage temperatures, liquid level and mechanical movement. Also illustrated are transformer-relays and a complete line of hermetically sealed mercury switches. Each control with accompanying description and technical data, can be easily located by a dual index. *Mercoild Corp.*

... FOR YOUR COPY, CIRCLE NO. 139

MICROFILMED DATA

Illustrated manual details how the Air Materiel Command of the Air Force has converted engineering drawings and data to microfilm mounted in aperture cards. The 8-page manual, a reprint, is of particular importance to Air Force contractors since new contracts require submission of engineering data on microfilm punch cards. *Filmsort Co., Div. of Minnesota Mining & Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 140

COPPER FURNACE BRAZING

A 24-page handbook incorporating the latest technical information on copper furnace brazing includes chapters on what the brazing process is, where used, "do's and don'ts" for designers, inspection methods, and charts and tables of engineering data. The illustrated booklet is entitled, Design for Controlled Atmosphere Copper Furnace Brazing. *Fabrilform Metal Products, Div. of George Getz Corp.*

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APPLICATIONS OF MOLYBDENUM

This brochure lists the forms of molybdenum available commercially and explores new avenues of application opened by recent technological advances in the refractory metals field. The 12-page brochure also describes the physical properties and production processes of molybdenum. *Sylvania Electric Products Inc.*

... FOR YOUR COPY, CIRCLE NO. 142

NEW PLUG-IN BUS DUCT

Bulletin discusses new type of bus duct developed for safety, economy and advanced design concept to fit industry's changing needs. Describes features which include safety for operator; withstanding unusual electrical and mechanical stresses; incorporation of lowest possible voltage drop practical and simplified joint with a minimum of bolts. *Bulldog Electric Products, Div. I-T-E Circuit Breaker Co.*

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EVAPORATIVE WATER COOLERS

Pamphlet describes a blow-through type of evaporative water cooler giving general specifications covering housing, coils, spray section, motor pump unit, fan section, legs and finish. Points out that water circulating through condenser is in a closed circuit where it can be easily controlled for hardness or corrosive elements. *Drayer-Hanson Div., National U. S. Radiator Corp.*

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PROGRESSING-CAVITY PUMP

Brochure pictures, describes and gives full technical data on pump designed on the progressing cavity principle. Lists materials that can be pumped with the model; discusses performance, including self-priming, positive displacement, uniform flow, low internal velocities, pumping solids in suspension, passing particles, reversibility, versatility, and durability. *Robbins & Myers, Inc.*

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PAPER TAPE ACCESSORIES

Data sheet describes three new paper tape accessories for firm's general purpose digital computer used for data processing, research computations and on-line data reduction and control. New units include an auxiliary photoelectric paper tape reader, a multi-code high-speed tape reader and an auxiliary paper tape punch. *Bendix Computer, Div. of Bendix Aviation Corp.*

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1960 PRODUCTS CATALOG

New listing of products include alloys and metals, carbon products, chemical products, industrial gases and equipment, plastics, nuclear products and consumer products. The two-color, 16-page catalog also contains a table of the firm's trademarks, sales offices, divisions and subsidiaries as well as a condensed summary of products. *Union Carbide Corp.*

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COLD DRAWN TUBING

Let's check the requisitions today. Here's TUBING. Carbon Steel for Al's hydraulic line in Shop #12. Hmm, Pete says rush the Alloy footage for the hot order of ejection seats. And we'll have to get Stainless for the sea water pumps. That's an easy one; can get all three from one source, too! JEAN! Type out a P.O., please, and send it to

PACIFIC TUBE COMPANY

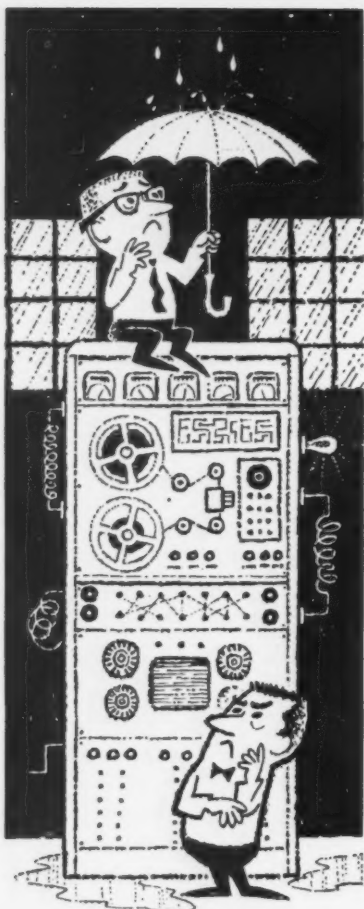
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STEEL EQUIPMENT CATALOG

New 92-page catalog illustrates complete line of steel equipment products for business, industry, institutions, homes. Contains product views and specifications. New introductions include office machine cabinet, office machine table, typewriter attachment for desks, drawing table, two wood-working benches, desk high bookcase, full height bookcase and drawer tool stand. *Lyon Metal Products, Inc.*

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RIVETING ALUMINUM

This 52-page booklet covers use of conventional and special rivets and explains design and fabrication of riveted joints. Discusses many aspects of riveting aluminum such as determining the shear strength of a driven aluminum rivet or the best hole size for a hot-driven aluminum alloy rivet. Tables list weights and dimensions of aluminum rivets and recommended rivet lengths. *Reynolds Metal Co.*

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ELECTRICAL SYSTEMS

Illustrated 60-page catalog lists firm's standard and engineered products in fast-reference form to aid distributors, contractors, engineers in selecting equipment for industrial plant and commercial building electrical distribution systems. Covers molded case circuit breakers, individually-enclosed low-voltage power circuit breakers and engineered products. *I-T-E Circuit Breaker Co.*

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DOCKBOARDS AND RAMPS

Illustrated brochure provides practical engineering data and charts for specifying dockboards and ramps to fit all rail and truck uses. Includes instructions for determining axle capacity, width and allowances, crown or bend degrees, underclearances, locking range, park-out dimensions, height differentials and span sizes. Illustrates standard and job-engineered adaptations. *Magnesium Products of Milwaukee.*

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PORT LANDS FOR INDUSTRY

Fact-filled catalog of industrial lands being developed by the Port of Portland Commission. Describes plans for and advantages of the Port's 650-acre, city-center Swan Island Industrial Park. Also maps and pictures of two other port plant sites. *Port of Portland Commission.*

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RENTING STEEL SHEET PILING

Booklet discusses advantages of renting sheet piling, illustrates typical applications, and details standard, rolled and fabricated sections. The 24-page catalog illustrates typical pile arrangements for rectangular and circular cofferdams, lists nominal lengths of straight walls and dimensions of pile cells. Special sections describe lightweight sheet piling, H-bearing pile, rail and pipe pile. *L. B. Foster Co.*

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POWDER COMPACTING PRESSES

Brochures giving specifications and design features on four models of powder compacting presses for automatically and continually forming solid compacts from dry, powdered or granulated materials at high production speeds. Uses include powdered metal parts, ceramic insulators, carbon brushes and resistors and electronic iron cores. The four Kux machines have 10, 20, 30 and 75 tons of pressure. *Fernholtz Machinery Co.*

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TIMING BELT DATA BOOK

New publication presents complete and detailed information on the selection, design, installation, operation and maintenance of timing belt drives. Typical uses that are described and illustrated range from electric typewriters to high torque applications in heavy industrial equipment. The 55-page engineering catalog and data book contains many tables, photographs and illustrations. *R. & J. Dick Co., Inc.*

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LEHR BELT ALLOYS

Reprint of an article on the effect of higher annealing temperatures on lehr belt alloys. The study points out that as faster, more economical production is achieved in annealing and decorating lehrs, higher temperatures will be encountered. Discusses which alloy of wire is best suited for the fabrication of the lehr belt designed to withstand the effects of these higher temperatures. *Cambridge Wire Cloth Co.*

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STAIN REMOVAL TECHNIQUES

Handy data sheets designed for maintenance staffs of factories, offices and institutions lists 13 of the most common stains to carpets and safest methods of removal. Another deals with removal of stains from floors, taking into account the many different floorings in use. *Puritan Chemical Co.*

... FOR YOUR COPY, CIRCLE NO. 157

NEW ALUMINUM BRONZE ALLOY

Paper describes new aluminum bronze alloy that resists stress-corrosion cracking of particular interest to users of bronze welding electrodes. Other topics covered include: the repair welding of drop forge hammer guides; the overlaying of automotive trim molding dies; and the fabrication of office furniture. Also discusses recent developments in firm's alloys and products. *Ampco Metal, Inc.*

... FOR YOUR COPY, CIRCLE NO. 158

RESISTANCE WELDING

Bulletin is fifth of a series which fully describes a variety of resistance welding case histories. These include fabrication of the moon-bound Juno II missile; sandwich structure permitting great savings; how to spot weld magnesium; joining paper thin insulation sheets to form jet insulation blankets, and; spot weld technique responsible for new miniaturized thermocouple to study aero-dynamic heating. *Sciaky Bros., Inc.*

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PLANT-WIDE SAFETY

Colorful catalog features 15 different products to aid safety directors and maintenance engineers in planning and executing industrial maintenance and safety identification programs. The 32-page catalog covers proper marking of piping systems, identification of plant wiring and electrical equipment, correct lubrication of machinery, and marking of hazardous plant areas and equipment. *W. H. Brady Co.*

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GIANT-SIZE STAPLES

Bulletin describes a carton stitcher that makes staples with crowns up to 1½ ins. wide from roll wire, cutting in half the time required for carton closure and making a more rigid finished package. Pamphlet includes photos of various stitchers, features, drawings of cartons showing examples of use of big staples versus smaller staples. *Ideal Stitcher Co.*

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ROLLING DOORS, PARTITIONS

New 20-page color catalog shows line of steel and aluminum rolling service doors, fire doors, rolling grilles, extruded aluminum counter doors and wood side-coiling partitions. Includes architectural specifications and detail drawings covering all types of standard and special situations. *Cookson Co.*

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WESTERN INDUSTRY/FEBRUARY 1960

BIG WHEELS and LITTLE WHEELS



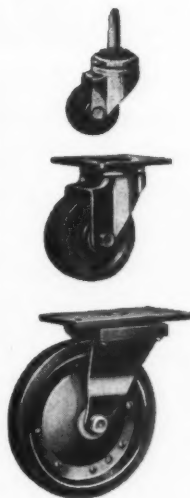
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Colson has more answers about casters than anybody because Colson has more casters — 1458 styles, types and sizes. There are swivel and rigid types with scores of different stems and top plates. Wheel sizes ranging from 1 to 10 inches in diameter. Steel, aluminum and plastic wheels with hard or cushion treads or pneumatic tires. Load capacities ranging from 75 to 1500 lbs.

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SPECIAL MANUALS

FOR YOUR FREE COPY, CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, p. 69

ABRASIVES

Masonry and Concrete Cutting

Fact sheet about the Di-namic diamond blades, three types, for masonry and concrete cutting. Describes a quicksilver blade for concrete, a blade reinforced with fiber-glas for portable electric handsaws and a quicksilver "shatterproof" blade for masonry. *Victor, Inc.*

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Rubberized Abrasives

New catalog tells how rubberized abrasives can be used and what they can do on a broad list of high precision manufacturing operations on tools, dies, molds, instruments, models and component parts. Contains advanced application information, operating instructions, tables, illustrations and latest technical information for reference. *Cratex Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 201

The Diamond in Abrasives

Three booklets make up this diamond series: (1) Facts you should know when buying and using diamond; (2) Metallographic polishing with diamond, and (3) Diamond compound vs. diamond powder. Also, a seven page brochure on a diamond abrasive compound includes chart giving general recommendations, grade, micron size range, mesh size equivalent and the compound number, color and diamond content. *Abrasives Div., Elgin National Watch Co.*

... FOR YOUR COPY, CIRCLE NO. 202

221 Page Abrasive Handbook

Pocket-size, this handbook is a guide for the tool room operator or the apprentice in the proper selection and use of grinding wheels. Explains the principles and methods of grinding various types of tools and cutters—carbides as well as high-speed steel and cast alloy types. The book is well illustrated, containing photographs and tables of useful information including instructions for the safe use of grinding wheels. *Norton Co.*

... FOR YOUR COPY, CIRCLE NO. 203

Abrasive Grain Products

Brochure describes a silicon carbide abrasive used for hard, brittle substances like gray iron, chilled iron, cemented carbide tools, hard alloys, glass, marble, stone and ceramic products. Further discusses its use on low tensile strength materials such as brass, soft bronze, aluminum, copper, rubber and leather. Also discusses an aluminum oxide abrasive recommended for hard substances such as carbon steels, alloy steels, highspeed steels and annealed malleable iron. *Exolon Co.*

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Precision Wheel Dressing

Diamond tools for precision wheel dressing are set forth in this catalog showing single point, multi-diamond, radius, valve refacer, valve seat grinder and thread grinder dressing tools. The 11-page catalog includes drawings, charts, specifications as well as mesh sizes of diamond powder. *Nesen Diamond Tool Corp.*

... FOR YOUR COPY, CIRCLE NO. 205

Wet Abrasive Cutter

Folder describes Campbell 406 which can cut hardened steel, high temperature-resistant alloys, corrosion-resistant steels and many of the new exotic metals up to 6 in. round or square at the rate of 4-8 seconds per sq. in. Gives standard specifications, rated capacity, hp. ratings of motors, wheel spindle speed, cutting wheel dimensions, floor space requirements and weights. *Allison-Campbell Div., American Chain & Cable Co.*

... FOR YOUR COPY, CIRCLE NO. 206

Grinding Safety Feature

Descriptive sheet about newly developed safety back flared cups to insure operator safety in using abrasive wheels. A new approach to operator safety, the features of the innovation are covered including performance, safety, mounting, light weight as well as the advantages to the operator. Safety back flared cup specifications are presented in table form. *Manhattan Rubber Div., Raybestos-Manhattan, Inc.*

... FOR YOUR COPY, CIRCLE NO. 207

Blast Cleaning Abrasives

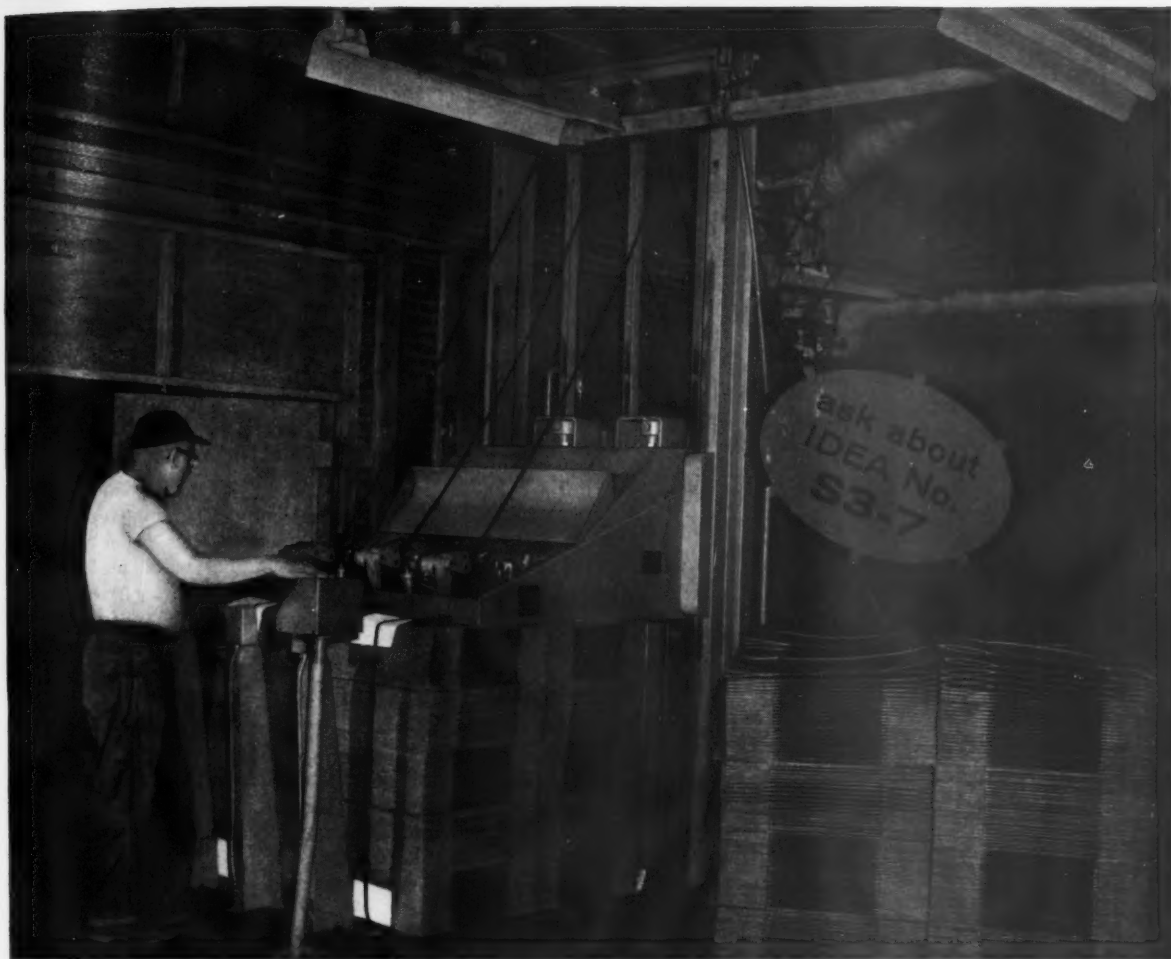
Handbook containing information designed to help users of blast cleaning equipment get higher production and finer finishes at lower cost for abrasives and maintenance. This 19-page bulletin covers general information, product information about the firm's steel abrasives, manufacturing processes and statistical data from the company's abrasive laboratory. *Wheelabrator Corp.*

... FOR YOUR COPY, CIRCLE NO. 208

Metal Finishing Wheels

Illustrated booklet describes newly introduced wheel providing a new concept in coated abrasive use. Discusses design offering unusual conformability to irregular shapes and elimination of many hand operations in metal finishing. Covers uses on portable tools, bench machinery, stationary lathes and automatic equipment. Examples of on-the-job accomplishments of the wheel are shown in removing imperfections, polishing, buffing and blending. *Minnesota Mining & Mfg. Co.*

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Call your AIM*... Container Corp. of America does ...
F3B Strapping Machine increases production 50%

CONTAINER CORP. OF AMERICA, CINCINNATI, OHIO, felt they'd be money ahead if they would discard hand strapping tools and install an Acme Steel F3B Strapping Machine. And right they were. Smoother production flow has resulted, with less floor traffic and confusion caused by scattered hand strapping operations at every finishing machine. (Idea No. S3-7)

Now, stacked corrugated cases are power-conveyed to a central strapping station where one man handles all strapping operations. The F3 Strapping Machine compresses the stack, then tensions, cuts and seals up to three straps simultaneously. All through push-button controls.

The results: 50% greater strapping production, better stacking due to uniform compression and strap tension, and greater utilization of storage areas.

*Call your Acme Idea Man. His experience includes answers to production problems like yours. Or write Dept. WCS-20, Acme Steel Products Division, Acme Steel Company, 4901 Pacific Blvd., Los Angeles 58, California. Also San Francisco, Seattle, Portland.

Acme Idea Man
 Mike Gerhardstein
 has helped many
 companies set up
 better strapping
 operations.



STEEL STRAPPING

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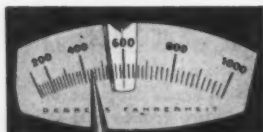
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Equipment*

Good looks are only part of the story of Partlow's spectacular new control! The MFS is rugged and efficient, its tough mercury-actuated element built to retain sensitivity and accuracy even under extreme conditions. Convenient, too! You can interchange the mercury element right out in the field . . . no factory adjustment required.

The MFS comes in 10 scale ranges. Accurate within 1/2 of 1% of scale range, it is especially adaptable to control applications where temperature variations must be kept at a minimum; or where sudden temperature changes demand instant response.

If your product or process requires close, positive temperature control within the -30°F. to 1100°F. range, you are invited to test this new instrument soon. Call or write Pacific Scientific Company for complete information.

**Only in the Partlow MFS
so many important
innovations . . .**



Accu-Vision Dial—Magnified pointer for closest settings. Scientifically color-contrasted for easy readability—even at a distance.



Flush or Wall Mounting—No additional brackets or hardware required. Grey reinforced plastic case. Tough, lightweight, easy to clean, won't crack under extreme temperatures.

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- Missimers Incorporated
- Partlow Corporation
- Soiltest Incorporated
- Timus Olsen
- Testing Machine Co.
- Wilson Mechanical Instrument and Helicoid Gage Divisions of American Chain & Cable Co.

Masonry Cutting Equipment

Pictures and descriptions of newly expanded line of masonry cutting equipment, including abrasive and diamond blades, heavy-duty masonry saws, concrete cutting saws, a standard masonry and a stone cutting saw. *Trucco Masonry Drilling Div., Wheel Trueing Tool Co.*

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Resinoid Bonded Snagging Wheels

Abrasive wheels for swing frames, automatics, floor stands and portables are described in this color folder. Discusses features of the wheel and its uses in grinding billets and castings. On-the-job examples are given as well as wheel recommendations for various materials. *Macklin Co.*

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Oriented Diamonds in Formed Dressing Tools

Technical paper entitled "Oriented Diamonds Give Maximum Performance in Formal Dressing Tools". Nine pages, illustrated and documented, this paper gives the practical observations of the author based on a lifetime of grinding, sawing and cleaving industrial diamonds for use in diamond tools. *Clipper Diamond Tool Co.*

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Abrasive Air Tools

Six-inch grinders for heavy duty are described in pamphlet containing photos as well as technical data. Features outlined include 50 per cent less exhaust noise, exhaust deflector, less operator fatigue, quality construction, low maintenance and new safety with a positive over-speed control. *Thor Power Tool Co.*

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Guide to Wheel Selection

A smaller than pocket-size, 19-page guide to wheel selection covers standard types of grinding wheels, markings, general recommendations on tool and surface grinding, general purpose segments, cylindrical and centerless grinding, cutting off and snagging. A general catalog of the firm's grinding wheels and other bonded abrasive products is also available. *Fuller Merriam Co.*

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Abrasive Finishing Methods for Steel

Data sheet contains detailed recommendations for producing selected finishes on carbon and stainless steels. Information includes abrasive compound recommendations, wheel speeds and types of buffs. There is also a section on blending and simulating mill finishes on stainless steel for blending in weld marks and for the removal of tool and die marks. *Lea Mfg. Co.*

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Rotoblast Table-Rooms

Of special interest to producers of castings or weldments in a wide variety of shapes and sizes, this 12-page bulletin describes push-button controlled rotoblast table-rooms designed to clean various-sized pieces. Illustrated field reports show installations on difficult cleaning jobs previously done by hand. The units are designed to clean pieces ranging from small parts to castings up to 10 ft. wide weighing as much as 6 tons. Includes dimensions and specifications of 8 table-rooms, including a new two-table type. *Pangborn Corp.*

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Abrasive Cords and Tapes

Sample card of 13 round and flat cords and tapes of emery, crocus, aluminum oxide and silicon carbide. Card gives number, approximate diameter and grain of abrasives for polishing and burring small holes, slots and dies. *E. C. Mitchell Co.* . . . FOR YOUR COPY, CIRCLE NO. 217

Grinding Wheel Chart

Ten do's and 10 don'ts for grinding wheel operator safety are listed on this two-color wall chart. The information contained in the chart is based on the rules and regulations established by the American Standard Safety Code for the Use, Care and Protection of Abrasive Wheels. *Grinding Wheel Institute.* . . . FOR YOUR COPY, CIRCLE NO. 218

Diamond Wheel Catalog

Wheel facts, construction and type designations are thoroughly covered in this 16-page catalog. Includes diagrams and listings for a line of diamond wheels suitable for grinding chipbreakers, milling cutters and reamers, surface grinding or offhand grinding of single-point carbide cutting tools. *Anton Smit & Co., Inc.* . . . FOR YOUR COPY, CIRCLE NO. 219

Coated Abrasive Strips

Data sheet describes new split drum sander for use in metal working industry. Discusses use of strips of coated abrasives in place of abrasive belts. Includes photographs, diagram of the split drum, operating speeds as well as a table showing diameter of the split drum and length of strip used. *Hargreaves Industrial.*

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Abrasives for Common Operations

Twenty-seven page catalog covers stock abrasive items for use in the more common operations. Includes a standard wheel marking chart, bonds and abrasives listing and general purpose, tool room, internal, cylindrical, centerless, cut off, surface, snagging and disc grinding product information. Contains complete specification data. *Sterling Grinding Wheel Co.* . . . FOR YOUR COPY, CIRCLE NO. 221

Abrasive Discs for Flat Surfaces

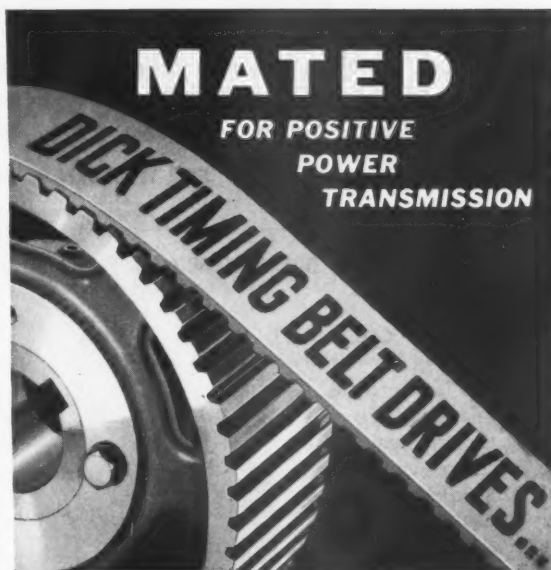
Catalog outlines factors to consider in selecting abrasive discs: material, stock removal, area in contact with abrasive, desired finish, required accuracy, rate of production, grinding method, wet or dry grinding and spindle speed. Discusses construction of discs, variety of faces, abrasive markings, grains and range of thicknesses and diameters of abrasive discs. The 19-page catalog contains photographs and tables. *Gardner Machine Co.*

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Versatile Applications of Abrasives

The booklet, "The Finishing Touch" reports a new portable belt sander, giving in addition to general information, types of abrasives to use. The 23-page booklet also makes general abrasive belt recommendations and contains an abrasive chart for woods. Describes how belts can be interchanged, making it easier to work through three or four grades of grit from coarse to fine or to change from woodworking to metalworking abrasives. *Porter-Cable Machine Co.*

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Money-Saving Answer to Many Drive Problems

Rugged nylon faced neoprene teeth silently grip the mating sprocket, and give the revolutionary power transmission action of Dick Timing Belt Drives. When designing a machine, or selecting a drive, check their advantages, including:

Positive, Non-Slip Transmission of Power—No Lubrication—Minimum Friction and Backlash—Constant Angular Velocity—Compact Design—Quiet, Lightweight—Wide Speed Range—Economical Operation.



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NEW EQUIPMENT

FOR WESTERN PLANT OPERATION, PRODUCTION AND MAINTENANCE



USE RIP OUT POSTCARD, PAGE 69, FOR MORE INFORMATION ON PRODUCTS DESCRIBED

EDDY CURRENT COUPLINGS

...adjustable speed drives, 5 through 100 hp. ratings

New line is offered as a complete packaged drive including the drive unit, control enclosure and operator's control station. The new drive offers versatile performance over a constant-torque speed range. Ratings through 20 hp. are capable of continuous operation down to 100 revolutions per minute at rated torque, providing a speed



range of approximately 17 to 1. Automatic control provides close speed regulation as standard. *General Electric Co.*

... FOR MORE DETAILS, CIRCLE NO. 250

GIANT MIXER

...operated by oil-hydraulic lifting cylinder

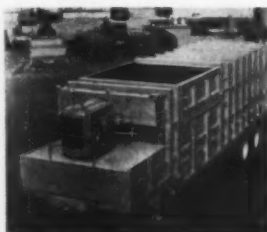
For use in the manufacturing process of paint, plastics, chemicals, soap, and many food products, this giant mixing machine is raised, lowered and rotated by means of an especially-designed oil-hydraulic lifting cylinder. The pedestal-based cylinder has a total lifting capacity of 1800 lb., and can raise the motor driven mixing machine to a total height of 43 inches. The cylinder is completely self-contained, utilizing the space inside the plunger as an oil reservoir. An electric motor driven oil pump forces the oil into the cylinder area causing the plunger to rise. The unit is controlled by means of a pushbutton station at the end of an extension cord convenient to the operator. *Globe Hoist Co.*

... FOR MORE DETAILS, CIRCLE NO. 251

HYDRAULIC COMPACTION TRAILER

...reduces plant waste to a fraction of former volume

This large hydraulic packer is designed for use by manufacturers who generate huge quantities of waste, or who face the problem of long hauls to the refuse disposal areas. Available in two sizes, model DB-42 will hydraulically pack in approximately 160 cu. yds. of loose refuse. Model DB-53 will hold up to 210 cu. yds. The compacting operation is completely hy-



draulic and can be handled by any standard fifth wheel tractor or used with a tandem tractor. *Dempster Bros.*

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STRAPPING TOOL

...lightweight, reel-fed for quick handling

Strapping tool has a new type gripper opening that makes loading and aligning $\frac{3}{8}$ in., $\frac{1}{2}$ in., $\frac{5}{8}$ in. and $\frac{3}{4}$ in. strap a fast, easy job. The tool can be operated by a right or left handed person with the reel in front of or behind the operation. Being reel-fed, the tool has a continuous unlimited take-up eliminating the need to pre-cut the strap. Since the seal can be placed behind the take-up wheel, strap waste is eliminated. A wide-faced take-up wheel permits extremely high tension, while a finely graduated take-up holds the exact tension desired. The new tool is ideal for compressible or non-compressible items of every type, size and shape. *A. J. Gerrard & Co.*

... FOR MORE DETAILS, CIRCLE NO. 253

DISTRIBUTOR TESTING MACHINE

...analyzes distributors, provides complete visibility

New machine provides quick check-out, accuracy and easier distributor servicing and parts replacement. It checks contact point cam angle or dwell for each cam lobe, shows up wear in distributor shaft and bushing, checks centrifugal governor advance against factory specifications, checks vacuum spark advance, shows up wear in breaker plate and housing, shows up wear in cam, shows contact point bounce and point creepage. Unique



feature is that the distributor vise is mounted off to the side, providing complete visibility of the 360 deg. scale. *Snap-on Tool Corp.*

... FOR MORE DETAILS, CIRCLE NO. 254

INORGANIC BOARD

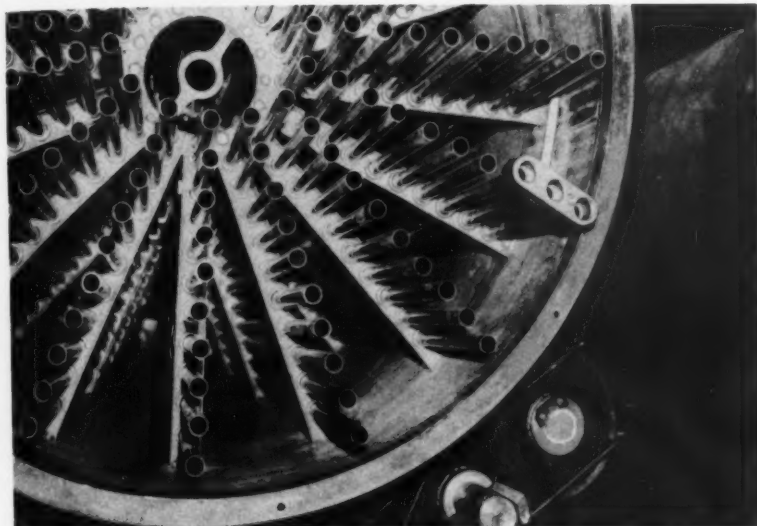
...insulating sheet material for industry

An inorganic insulating sheet material that combines light-weight and structural strength is 100% incombustible. It can be used for ovens, ceilings, partitions, back-up board for pre-laid tile or brick facing, duct work, firewalls, fireproofing structural steel, heat screens, housings and breechings, and high temperature test chambers. Available in sheets up to 4 x 8 ft. in size, the white board can be worked like wood without damage to woodworking tools, and takes and holds nails and screws like lumber. Structure of the new board is homogeneous throughout, providing uniform control of heat transfer. *Union Asbestos & Rubber Co.*

... FOR MORE DETAILS, CIRCLE NO. 255

BYERS GUIDE

Maintenance and Operating Tips from A. M. Byers Company



Lafuaille crystallizers, like the one pictured above in a sugar refinery, use cold drawn 4-D Wrought Iron tubing. 4-D Wrought Iron heat exchanger and condenser tubing is virtually unaffected by refrigerating gases such as ammonia, carbon dioxide and Freon. Highly resistant to both corrosion and abrasion, 4-D lasts longer than many higher priced ferrous and non-ferrous metals in salt water, heat transfer brines, and industrial cooling waters.

Industrial Plants Report a Tubing Material More Durable Than Expensive Alloys

Industrial maintenance records indicate cold drawn Wrought Iron tubing displays more durability than expensive alloys and non-ferrous materials. Invariably, 4-D gives longer tubing service life than carbon steel.

Here are two reports on typical industrial applications:

- A double-tube ammonia condenser in an ice plant had steel tubes. The cooling water used in this condenser contains 76 ppm of sodium chloride. The steel tubes failed after 2 years and were replaced by Wrought Iron tubes which are still in excellent condition after 18 years.
- Vaporizers for butane and propane gas production handle petroleum under pressure at ambient temperatures (10°F. min.). Petroleum is vaporized by passing steam at 10 psi and 265°F. through tubes inserted in the jacket. The unit operates continuously. In this application mild steel tubes were destroyed in 3 to 6 months and stainless

steel tubes in 6 to 9 months. Wrought Iron tubes are serviceable for at least two years.

We have a technical report which covers briefly, but informatively, 15 similar heat transfer equipment installations. Actual names and places of the installations appear in this report. Comparative cost-per-foot-per-year figures have been calculated for Wrought Iron and steel. A copy of this convincing study will be sent to you upon request.

In Sulfuric Acid PVC Bests Stainless at 1/5 the Cost

Stainless steel pipe often fails where Byers Polyvinyl Chloride Pipe doesn't. Take sulfuric acid applications. Here, Byers PVC Pipe not only out-performs stainless in terms of corrosion-resistance, but costs less on an installed cost basis: only one-fifth the cost of stainless.

In a wide range of other corrosive applications where metal pipe is either unsatisfactory or quite costly, Byers PVC provides constant, un-

Stack Service Life: Ripe Old Age or Early Demise?

The material you select for stack applications can make the difference of a lifetime. 4-D Wrought Iron resists acidic flue gas corrosion much more successfully than ordinary steel. Moreover, the protection of a 4-D Wrought Iron stack costs much less than a masonry stack.

4-D Wrought Iron in stack service gives no evidence of the rapid deterioration so characteristic of conventional materials. Although costing somewhat more than steel, 4-D often lasts more than twice as long. This saves the cost of at least one re-fabrication and re-installation, as well as accompanying interruptions and downtime. When building new stacks or replacing old ones, consider the long service life of 4-D Wrought Iron.



4-D Wrought Iron plate lengthens stack life, reduces maintenance costs at new Owens-Illinois Glass Company plant in Atlanta, Ga.

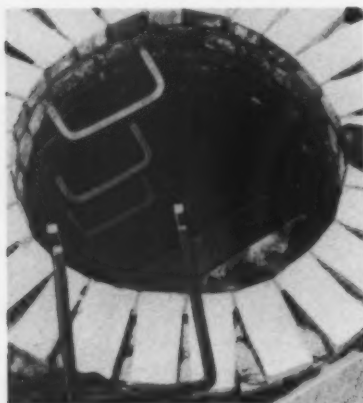
interrupted service. In acid fume vent piping, acid reactor blowoff lines, drain and sewer lines, and process lines handling acids, alkalis, oxidizing agents, alcohols, brines, plating solutions, slurries and the like. Where product purity is important, Byers PVC Pipe is especially suitable. It won't contaminate. We have a raft of performance data on our PVC. Write us about your specific application or problem.



BYERS GUIDE

Maintenance and Operating Tips from A. M. Byers Company

page 2



Wrought Iron rungs are shown here set in masonry in the 85-foot Main Avenue water tunnel shaft in Cleveland, after serving 55 years. Because of uneven spacing, the old rungs were burnt off and replaced with new ones of 4-D Wrought Iron.

How Safe Are Your Manhole Ladder Steps?

To provide workmen with safe, secure footing on manhole ladders, it is imperative that the steps be corrosion-resistant. Damp, humid atmospheres found in tunnels are death to ladder steps made of ordinary metals. Ordinary metals don't stand the test of time and wear as well—or as economically—as 4-D Wrought Iron. 4-D is durable. Safe. Practical. Needs no protective coatings. A firmly anchored protective scale, developed by the material itself, acts as a shield against further corrosive attack. No other metal has this unique capability.

Many plants have developed a standard design for 4-D Wrought Iron ladder steps and stock them in quantities at the warehouse. Play it safe. Use 4-D Wrought Iron for fabricating your new ladder steps—or for replacing old ones.

U. L. Approval for 4-D Wrought Iron Conduit

Certification of 4-D Wrought Iron electrical conduit by Underwriters' Laboratories, Inc. offers plant people another new weapon for battling corrosion. The labeled conduit is especially suitable for highly corrosive plant applications where attack by aggressive elements causes excessive maintenance or replacement of ordinary conduit materials.

Wrought Iron has been used for over 50 years in corrosive electrical conduit installations not requiring U. L. certification. Now, with the U. L. label, 4-D Wrought Iron can be used for any conduit application. There's no internal flaking or clogging with this conduit. Its resistance to vibration and fatigue stress is excellent. Fabrication is a cinch. And it's sherardized and coated with MVC-1 vinyl. This guarantees easy fishing.

Through an agreement between A. M. Byers Company and National Electric Products Company, U. L.-labeled 4-D Wrought Iron conduit is marketed through National's 11 warehouses, 29 district offices and authorized distributors throughout the United States.

A Welding Tip Or Two

Each of 4-D Wrought Iron's two components—high purity iron base metal and glasslike iron silicate—has its own fusion temperature. The siliceous material melts first (2100°-2200°F.), several hundred degrees before the iron (2730°F.). But don't confuse the fluxing of the iron silicate with melting of the actual base metal. Just continue heating until the iron fuses. 4-D's self-fluxing action contributes to sound, durable welds.

WHAT IS "4-D"?

Wrought Iron is a two-component metal—high purity iron impregnated with non-rusting iron silicate fibers. New 4-D Wrought Iron was achieved by substantially increasing the deoxidation of the base metal, slightly increasing the phosphorous content, and using a more siliceous iron silicate. Result is increased corrosion resistance, improved mechanical and physical properties.

Literature Available

Literature described below is available on request. For information on specific applications, write Byers Engineering Service Department.

New four-color booklet, **4-D Wrought Iron: A New Dimension in Corrosion Control**, discusses in detail Byers' latest product development. Includes a test section which is graphically illustrated and shows comparative corrosion resistance of 4-D Wrought Iron, standard wrought iron and other ferrous metals.

New ten-page bulletin, **Cold Drawn Wrought Iron Heat Exchanger and Condenser Tubes**, cites actual installations in which the use of 4-D Wrought Iron and other metal tubing in the same equipment permits service life comparisons. Lists copper-foot-per-year for each material and the corrosive conditions present.

In the most technically complete PVC catalog yet prepared, we discuss our latest piping material—rigid unplasticized polyvinyl chloride pipe—its characteristics, applications, properties and installation practices. The **Byers PVC Pipe Catalog**.

For additional information on 4-D Wrought Iron, contact Byers Division Offices in the cities listed below.

The maintenance and operating items appearing in BYERS GUIDE were prepared by the Engineering Service Department of



A. M. BYERS COMPANY

Pittsburgh 22, Pennsylvania

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA
PITTSBURGH • ST. LOUIS • SAN FRANCISCO • WASHINGTON, D. C.

4-D Wrought Iron is immediately available and may be obtained through established distributors of Wrought Iron Pipe. Plate, bar, and other flat rolled products may be ordered direct.

Corrosion costs you more than Wrought Iron

NYLON PRESSURE HOSE

... features a newly developed abrasion resistant cover

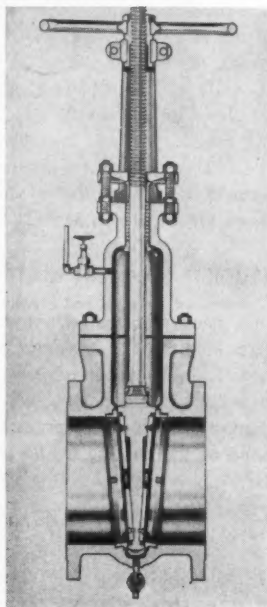
Hose with a specially formulated nylon inner tube reinforced with high tensile strength yarn exhibits outstanding resistance to flex, pressure-pulse and vibrational fatigue. It is unaffected by flammable and non-flammable hydraulic fluids and has a low freon permeability. While not recommended for use in mineral acids above 5% concentration, it has excellent resistance to caustics and most organic solvents; is non-toxic, non-corrosive, fungus resistant and will not embrittle in storage. As a non-conductor of electricity, the hose provides new safety and wear life in pressure applications requiring high voltage power lines. Also, the hose retains excellent flexibility and toughness in temperatures as low as minus 65 deg. F. It can operate constantly in temperatures up to 200 deg. F. and intermittently in temperatures as high as 300 deg. F. *Polymer Corp. of Penna., sub. of The Polymer Corp.*

... FOR YOUR COPY, CIRCLE NO. 256

BLOCK AND BLEED TEST VALVE

... features dual metal-to-metal and elastomer seals

A simple visual proof test upon each closure of the valve permits the operator to verify the effectiveness of seat tightness. Designed to outmode the use of auxiliary line blinds, this non-lubricated gate valve will perform efficiently and economically in services handling light gases or heavy fluids within a temperature operating range of minus 40 deg. F. to plus 400 deg. F. Valves are available in sizes 1/2 in. to 24 in. in the 150 lb. series, and sizes 1 1/2 in. to 16 in. in the 300 lb. series. Absolute shut-off promotes operational safety and eliminates the possibility of product contamination. *Pacific Valves, Inc.*



... FOR YOUR COPY, CIRCLE NO. 257

SILICONE VARNISH

... greater heat stability and resists moisture

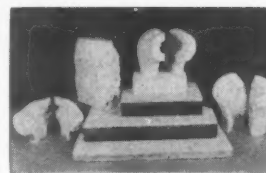
As easy to process as most Class A and B varnishes, all-new Class H silicone dipping and impregnating varnish has been announced. This new material cures in only six hours at 150 C. This is 50 C below the temperature required for other silicone varnishes. Run-off is substantially lower than that for other varnishes, assuring savings in equipment maintenance and clean-up time. Despite its low curing temperature, this new varnish meets AIEE requirements for use in 220 C systems, and is unaffected by many corrosive atmospheres. When used with other Class H components in power transformers, servo-mechanisms and electronic devices designed for higher temperature rise, the greater thermal stability of the new varnish permits smaller, lighter weight, more reliable units. *Dow Corning Corp.*

... FOR YOUR COPY, CIRCLE NO. 258

THERMAL INSULATION

... castable, quick-set, one-coat insulation cement

Unique feature of this new cement is that, without shrinkage, it can be packed by hand, troweled, injected, palmed, sprayed, or poured into any thickness. Also, the set or dried material can be re-used. This cement can withstand freezing without deteriorating effects and is non-rusting and non-corrosive to metals and materials. Ap-



plications include fiberglass board and blanket, rock cork board, foam glass block, rock wool blanket without use of hex wire. *Thermold Products Co.*

... FOR YOUR COPY, CIRCLE NO. 259

HOLD-DOWN CLAMPS

... new type clamp eliminates shims, saves time

Fast and simple to operate, this new tool clamps without shims to the full capacity of the clamp eliminating the need for vises on many jobs. It does not clutter work areas or tip over when clamping on to narrow grooves, ledges or corners, even one prong in position is strong enough to hold the work piece. Concave washers distribute pressure evenly and locate tangent point automatically. Designed for use on drill and punch presses, jig borers, planers, universal and vertical mills as well as production and tool room work. *Insta-Clamp Co.*

... FOR YOUR COPY, CIRCLE NO. 260

COMMUNICATIONS TOWERS

... easy assembly, of tubular alloy steel

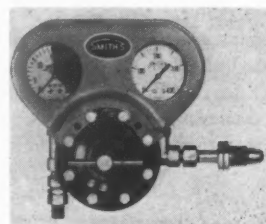
A complete line of high strength, tubular alloy steel communications towers, providing structures ranging from 10 to 500 ft. in height, meet or surpass Electronic Industry Assoc. windloading and other standards. The towers are of three-sided sectional design, the sections 10 or 20 ft. long and in four weights. The heaviest towers can be raised to 500 ft. with 30 lb. per square foot windloading. Guys are specified for the towers that are more than 100 ft. high in the heaviest models, and for lesser heights in the lighter models. *Motorola, Inc.*

... FOR YOUR COPY, CIRCLE NO. 261

REGULATOR FOR WELDING INDUSTRY

... for use with oxygen, acetylene and LP gases

A regulator with new safety features for the welding industry eliminates three of the most common dangers of regulator misuse. A regulator "Hard-hat" encloses the ordinarily exposed gauges, protecting them from exterior abuse and contributing to long, trouble-free life. The regulator "Flo-trol" on the down stream side prevents reverse flow and mixture of gases, eliminating one of the explosive dangers in use of a regulator. A safety inlet con-



nectors fits the inlet connection to the regulator, encouraging quick repair of damaged connections without special tools, resulting in safer use. *Smith Welding Equipment Co.*

... FOR YOUR COPY, CIRCLE NO. 262

TEST STAND DRIVES

...for simulating actual operating conditions

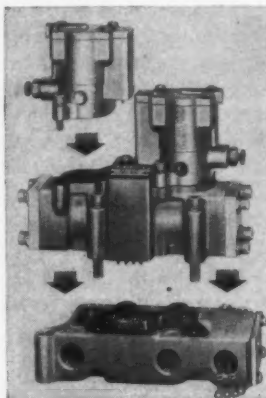
Generators, pumps and engines can be tested under high-speed operating conditions with this new line of test stand drives. In sizes from 15 through 40 hp., the new test stand drive provides smooth, stepless adjustable-speed from a constant-speed a-c. motor source. In the 15 through 25 hp. range, a 6:1 speed variation is available within the limits of 1000 rpm. minimum to 11,600 rpm. maximum. From 30 through 40 hp., a 4:1 speed range may be obtained anywhere from 1595 rpm. minimum to 11,600 rpm. maximum. The drive consists of a standard a-c. motor transmitting power through a rubber belt, which operates between two sets of cone-shaped discs. By changing the belt operating diameter, an infinitely adjustable output speed may be obtained. *Reliance Elec. & Eng. Co.*

... FOR MORE DETAILS, CIRCLE NO. 263

PLUG-IN CONTROL VALVES

...single and double solenoid, 4-way pilot operated

A new line of basic 1/2 in. control valves feature fast, automatic completion of electrical and pneumatic circuits. New one-piece solenoid pilot housings plus weight-saving aluminum bodies and sub-bases reduce maintenance time. All power connections, made permanently in manifold or sub-base, need not be disturbed for in-service maintenance. Electrical and pneumatic circuits to valve and pilot are completed automatically as these units



are plugged in and bolted down. *Valvair Corp.*

... FOR MORE DETAILS, CIRCLE NO. 264

TORQUE CONVERTER

...air-cooled, for small engine use

The air-cooled feature of this new torque converter permits use on existing engines without requiring auxiliary coolant lines, heat exchangers or fans. The unit is intended for such applications as small road rollers and cranes, farm tractors and other agricultural equipment, aircraft service and delivery vehicles, plus winches, mixers and industrial equipment. The torque converter has a 9-in. wheel and is rated at up to 80 lb. ft. torque input. Stall torque ratio is 1.7 to 1. For use with engines in the 10 to 50 hp. class, the new unit fits a standard SAE No. 4 flywheel housing. Dry weight is 73 lbs. *Clark Equipment Co.*

... FOR MORE DETAILS, CIRCLE NO. 265

DIGITAL VOLTMETER

...a one-package instrument with 4-digit resolution

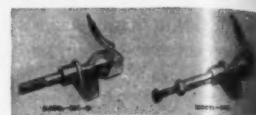
Designed for a wide range of DC measuring jobs and, with accessories, AC and low-level DC measurements, this new digital voltmeter features full four-digit (1.01%) resolution, high input impedance and an average measuring time of 0.75 seconds per reading. A one package instrument, it is 5 1/4 ins. high by 15 1/4 ins. deep for mounting in a standard 19-in. rack. *Non-Linear Systems, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 266

PLUNGER-TYPE TOGGLE CLAMPS

...for light assembly work, lock in two positions

Two new plunger-type toggle clamps that lock in either an extended or retracted position have been developed for general-purpose use in light assembly work of the electronics, aircraft and allied industries. Both clamps have a rated holding pressure of 95 lb. Centerless ground plungers are iridite coated to resist wear and corrosion effects arising from constant travel



through the base guide bushing. The base and handle are cadmium plated. Stainless steel rivet pins are used for connecting linkage between handle, base and plunger. *Detroit Stamping Co.*

... FOR MORE DETAILS, CIRCLE NO. 267

WASTEPAPER BALER

...hydraulically operated and controlled

Portable, this new hydraulic baler is powered with a 5 hp., 220/440 volt motor. The box size is 24 x 36 x 36 in. and produces bales of up to 400 lb. depending on the type of material processed. With both doors open to maximum width, the baler requires an installation area of 6 in. x 10 ft. x 10 ft., 6 in. Closed, its overall height is 12 ft., 6 in., width 48 in. and depth 36 in. Standard equipment includes the main operating switch, control valves, and hydraulic fluid. It can be set up anywhere and moved when required since it needs only the power lead hookup to be operative. *Apex Steel Corp., Ltd.*

... FOR MORE DETAILS, CIRCLE NO. 268

TRUCK TARPULIN MATERIAL

...increased strength and abrasion resistance

A neoprene coated nylon material has been developed after studies of average truck tarp performance showed the need for stronger constructions for heavy service. The new construction offers 300 per cent more abrasion resistance than other current neoprene materials, and greatly improved bond of the coating to the nylon. The adhesion is rated at 40 lb. per sq. in., and is unaffected by moisture. These improvements result in a tarp with a superior wind-whip resistance. *U. S. Rubber*

... FOR MORE DETAILS, CIRCLE NO. 269

PORTABLE LUBRICATOR

...permanently air-primed for plant-wide service

This new unit may be loaded by any lube pump in use or through use of a filler. It is light in weight, carried by a shoulder strap, holds five pounds of grease and provides one-hand operation for servicing machines equipped with hydraulic grease fittings. The lubricator, basically an air-primed grease container with a convenient length of hose and a control handle, can be readied for use in just minutes. During actual lubrication it provides the



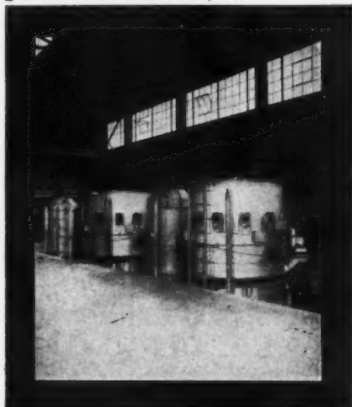
advantages of a power-operated unit. The control handle is a pressure-boosting type and one-hand operation allows quick access and servicing on hard-to-reach fittings. *Aro Equipment Corp.*

... FOR MORE DETAILS, CIRCLE NO. 270



Raw materials in select grades and types of low carbon and spring steels are held in substantial inventories at all times.

Modern annealing furnaces with electronic controls insure development of controlled grain structures and tempers.



The Sendzimir mill — Producing specialty strip in widths to 13" and in thicknesses of .008" to .085". Heavier gages to .125" are rolled on other mills

COLD ROLLED STRIP STEELS



View of finishing lines at the Calstrip mill. Slitting and edging operations in the foreground.

STAINLESS STRIP

SPRING STEEL

LOW CARBON

Specialty strip steels in a complete range of sizes, grades and types are produced by Calstrip at Los Angeles. These precision rolled products are designed to meet your most exacting requirements. Widths to 13" available in thickness range of .008" to .125". Profit from Calstrip's efficient local service and on-the-spot attention to all your strip needs.

Call RAYmond 3-1344 or Parkview 8-0541

Calstrip[®] STEEL CORPORATION

Mill and Offices: 7140 Bandini Boulevard Los Angeles 22, California

RESISTANCE BUTT WELDER

... produces continuous wire feeding

Advantage of this wire joiner is that it eliminates time delay from reel changing and wire threading in submerged arc welding as well as in other types of industrial operations using wire fed from a coil. Powered by a compact 60 cycle, 220 or 440 volt, single phase transformer, the wire joiner splices wire in sizes from 5/64 to 7/32 in. diameter in 1 to 6 seconds. To make joints in wire, the operator places the ends of the wire in tongs and starts the welder which automatically applies current, upsets the joint, and shuts off on completion of timed welding cycle. *Lincoln Electric Co.*

... FOR MORE DETAILS, CIRCLE NO. 271

MACHINE TOOL SPINDLES

... three of heavy duty type, interchangeable with standard types

First of a new line of precision spindles that have a tremendous design margin of safety to assure greater accuracy, these three models are heavy duty type with double row bearings, but no larger than standard spindles. *The DoAll Co.*

... FOR MORE DETAILS, CIRCLE NO. 272

PRESS FOR LAMINATING

... with controlled heat, endless belt transport

This press features controlled heat and controlled pressure for fast, strong bond and fine quality lamination of metal to plastic, metal to metal, wood to wood, and plastic to wood. For uniformity, the press features a controlled pressing time; the pressing cycle is adjustable from 15 seconds to 30 minutes, by 15 second segments. For speed as well as economy of operation an endless belt transport into, through and out of the press cuts maintenance, special wiring and servicing. *Thermo-Pneue Corp.*

... FOR MORE DETAILS, CIRCLE NO. 273

SMALL VACUUM BLOWERS

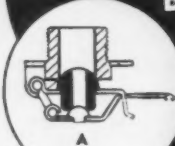
... for capacities from 30 to 1,000 cfm. and vacuum to 20 in. Hg.

Ten sizes are available in this new line of small vacuum blowers designed for elimination of internal valves, no contact between moving parts, little maintenance, maximum efficiency of rotor design and operating speeds, and minimum sealing-water requirements. At reduced vacuums, these units may be operated without sealing water in some applications. *Roots - Connersville, a division of Dresser Industries, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 274



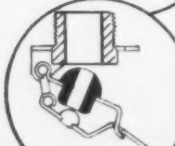
The Uni/RAP®
The ABC's of Better Trapping



A



B



C

Shown here is the "trigger-action" of the exclusive Dual Valve which produces faster warm up and tremendously increased capacity.

A Steam pressure across the large valve produces a tight positive seal.

B Weight of condensate opens small pilot valve slightly, instantly balancing pressure on both sides of main valve and opening it.

C Large orifice of main valve quickly discharges air and condensate with minimum wear and wire draw. This greatly increases capacity and permits live steam to enter faster to speed warm up.

Order by pipe size (from 1/2" through 2"). Each size automatically adjusts to pressures from 0 to 250 PSI, simplifies ordering and inventory control. Write for Bulletin No. 800F.

*Trade Name—Patented

"WHERE Good Connections COUNT"®

PERFECTING SERVICE COMPANY, 332 Atando Ave., Charlotte, N.C.
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New York—Providence—Hamilton, Ont.—Montreal—Toronto

... for more details, circle No. 39 on Reader Service Postcard

Babbitt Adjustable SPROCKET RIM
with Chain Guide
CHANGES THAT DANGER ZONE TO A SAFETY ZONE



The distance between the floor of your plant and your overhead valves is a DANGER ZONE when piled up boxes or even ladders are used to reach the valves.

Turn it into a SAFETY ZONE — equip your overhead valves with Babbitt Adjustable Sprocket Rims with Chain Guides.

- They simplify pipe layout.
- They fit any size valve wheel.
- They are easy to install and operate.
- They operate any valve from the floor.
- They save time and money.
- The first cost is the only cost (no maintenance).
- They are packed completely assembled (one to a carton), with easy-to-follow instructions.
- A hot-galvanized rust proof chain is available for all sizes.

Babbitt Adjustable Sprocket Rims with Chain Guide are carried in stock by most mill supply houses. If your supplier does not carry them, contact us direct.

Babbitt STEAM SPECIALTY CO.
13 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

... for more details, circle No. 40 on Reader Service Postcard

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WESTERN INDUSTRY/FEBRUARY 1960

ELECTRONIC TRACK SWITCH

... make conveyor systems more flexible to needs

A compact new track switch for power and free combination conveyor systems furnishes great adaptability to production needs. Electronically controlled through limit switches and solenoids, this rugged automatic track switch may also be operated manually through pull-chain attachments. Self-indexed carriers can route themselves automatically in and out of pre-selected processing or free storage lines, to and from stations, areas, and departments, or will re-cycle if required. Carriers also may be rerouted through manually operated switches as desired. Switches are available for right or left-handed movement. *Chainveyor Corp.*

... FOR MORE DETAILS, CIRCLE NO. 275

THERMOPLASTIC CHAINS

... flat-top conveyors prove worth in field tests

After nearly two years of field testing, flat-top conveyor chains of "Delrin" are now available. Less than one-third the weight of steel, the new chains have longer life, do not corrode, require no lubrication and little maintenance. The low-friction property of Delrin, acetal resin, reduces jarring when the chains start or stop and permits smooth operation at a wide operation of speeds. In field tests speeds of over 200 ft. per minute have been maintained. The flat links show exceptional resistance to deformation under load and virtually no warpage or discoloration under severe service conditions. Delrin is a strong rigid polymer of formaldehyde. *E. I. du Pont de Nemours & Co.*

... FOR MORE DETAILS, CIRCLE NO. 276

MODULAR ENTRAINMENT SEPARATORS

... of unitized construction and staggered rows

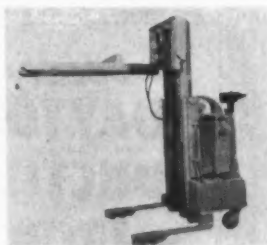
Entrainment separator modules made of impervious graphite for effective separation of entrained liquids from corrosive gas streams are now available. Designed for high collection efficiency and low pressure drop, the corrosion-resistant modules measure 1x2 ft. and can be easily assembled into banks to fit any duct or process vessel. Modules are available in two styles: style A is used in single-row entrainment separators or as the top row of larger assemblies; style B units for the lower rows have a gutter and downcomer to provide positive drainage of the liquid separated from the gas by upper units. *National Carbide, Div. of Union Carbide Corp.*

... FOR MORE DETAILS, CIRCLE NO. 277

HYDRAULIC FORKLIFT

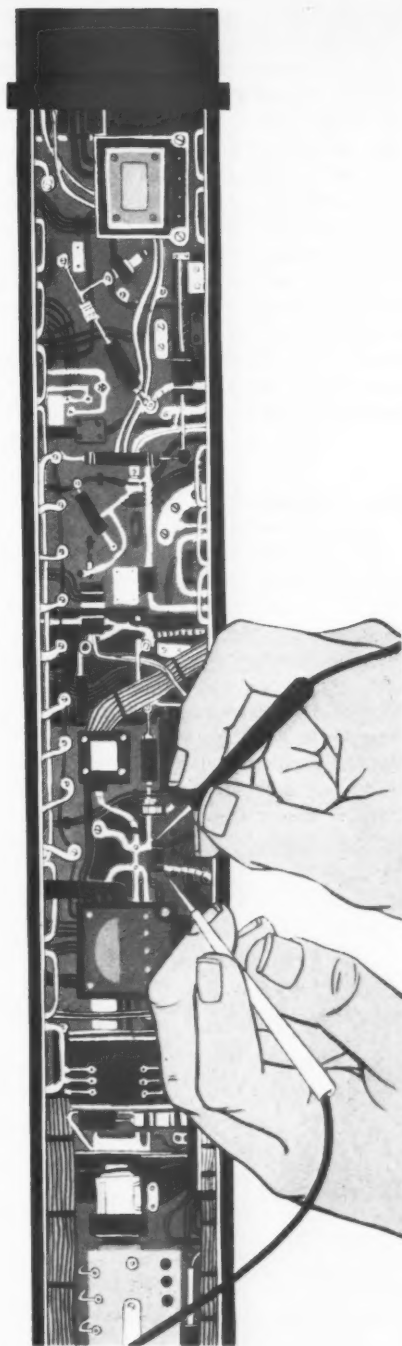
... designed for narrow aisles

A new Jackstacker Hydraulic forklift, combining the operating features of the standard high-lift walkie and the much larger counterbalanced fork lift truck has been developed. The special design allows narrow aisle operation and handling of loads in and out of bulk storage with no clearance between loads. The hydraulically operated forks extend beyond the front wheels of the truck



enabling a wide variety of pallet widths to be handled. *Lewis-Shepard Products, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 278



Electronics

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75

EXTENSIVE MINE CONVEYOR

... can operate as long as a week without being moved

Designed for use in underground coal and hard-rock mining, the new unit is comprised of a belt which rides on idlers mounted on sled-like skids spaced at 5-ft. intervals. The skids are held in alignment by wire ropes. A conveyor may be constructed with as many as 200 skids, making a unit 1,000 feet long. The equipment is located behind the mine loader which receives material from the continuous mining machine. An electro-hydraulic tractor with crawler traction is attached to each end of the conveyor, exerting constant tension on the belt to keep it taut. In addition to its function of pulling the conveyor unit and carrying the tripper, the versatile tractor can be used as a general purpose vehicle for various hauling and lifting jobs in the mine. *Hewitt-Robbins Inc.*

... FOR MORE DETAILS, CIRCLE NO. 279

RIGHT ANGLE GEAR DRIVE

... for dual engine-motor driven vertical pumps

New automatic combination right angle gear drive is designed for use with dual engine-motor driven vertical pumps in water works, sewage plants and fire protection systems. The drive permits testing of engine, from idle to operating speed without interfering with pumping operations. Any control system where electric power failure initiates engine start will operate the new gear drive. Sizes from 15 to 200 hp., with either solid or hollow shafts. Flexible shafting or couplings can be used between the engine and gear drive making installation simple; engine clutch is unnecessary. *Johnson Gear & Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 280



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LARGER-CAPACITY WATER METER

... hermetically sealed for limitless durability

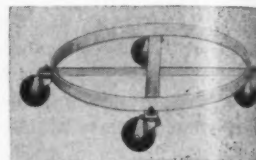
The new larger-capacity magnetic drive sealed register water meter, a 1-in. model, has a capacity of 50 gal. per minute compared with capacities of 20 and 30 gpm. respectively for the 3/8-in. and 1/2-in. models. Special features are a hermetically sealed register to end the problem of dirt, water and condensation that fog dials; a powerful magnetic drive which eliminates the need for a stuffing box, an exposed intermediate train and a driving cog; and the proven oscillating piston principle for long life and accurate measurement. *Rockwell Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 281

LIGHTWEIGHT DOLLY

... for drums, kegs, cartons, boxes

This handy and inexpensive dolly provides "on-wheels" storage, ready for instant movement of refuse cans and a variety of containers. Noise and wear on cans, containers and floors are eliminated. All hi-tensile cross braced, the steel frame is welded into a strong, one piece unit. The four swivel casters are bolted to frame for easier maintenance and have two rows of ball bear-



ing for easy movement in any 360 deg. direction. Solid rubber wheels with oil-seal type bearings. Recommended capacity is 300 lb. *Nutting Truck & Caster Co.*

... FOR MORE DETAILS, CIRCLE NO. 282

MULTI-SHIELDED MOTORS

... designed to operate under adverse conditions

A new development in standard drip-proof motors extends their usefulness on demanding applications such as food processing, chemical, oil-well pumping and car washing. With full overload characteristics, the new motor operates under conditions of continuous and excessive moisture, high humidity and temperature, salt spray, dust, oil and chemically contaminated atmospheres that previously required totally enclosed fan-cooled protection. A thin, non-porous, yet permanently resilient and flexible insulation is achieved by multiple application and controlled processing of a special silicone sealing compound. Available in all ratings from 1/2 hp. to 50 hp. *Sterling Electric Motor*

... FOR MORE DETAILS, CIRCLE NO. 283

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HOLLYDALE, CALIFORNIA



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SCROLL SHEAR

...for high speed automatic production

Elimination of the idle stroke between sheets is the feature of a new scroll shear for the production of scrolled strips used in the manufacture of can ends, screw caps and similar closures. The new shear makes every stroke a cutting stroke, materially increasing production. Capable of shearing sheets up to 36 in. sq., the shear is fitted with trimming cutters that can be ground in place by means of a standard slitter cutter grinder. Access to the cutters is provided by mounting the first table on gibbed ways so that it can be slid back from the second table. Cam-actuated side gauges on the first table adapt the scroll shear to either lithographed or plain sheets, while magnetic feed bars and hardened back gauges insure precise registry of the sheet for each cut. *E. W. Bliss Co.*

... FOR MORE DETAILS, CIRCLE NO. 284

DISTRIBUTION TRANSFORMERS

...for surface mounting on a concrete pad

A transformer through which both the primary and secondary underground cables are brought into a tamper-proof enclosure for connection to terminals. Useful for builders of many new residential and commercial developments employing underground distribution systems as the transformers can be screened with shrubbery. Built in single-phase ratings 25 through 167 Kva and three-phase ratings 75 through 500 Kva, 15 KV and below. Features include maximum operating efficiency, service continuity, complete safety, low maintenance cost and easy adaptation to handle future load growth. *Wagner Electric Corp.*

... FOR MORE DETAILS, CIRCLE NO. 285

AIR-POWERED SCREW DRIVER

... compact tool reduces exhaust noises

The Cushionair screw driver features a 5-vane motor, dual-speed throttle, scientifically-designed muffler to reduce exhaust noises without loss of power. It has a built-in lubricator, a speed regulator, and an easily cleaned air strainer to protect the motor from air line dirt. In addition, the pistol grip models feature a dual-speed throttle for easy screw starting at low speed, and full speed for quick, smooth driving once the screw is started. The user has a choice of three clutches and two handle styles. Both reversible and non-reversible models are available, the non-reversible models are available in speeds ranging from 4500 rpm. to 450 rpm. and the reversible models run from 3400 to 350 rpm. *Ingersoll-Rand Co.*

... FOR MORE DETAILS, CIRCLE NO. 286

FLUORESCENT FIXTURE

...for industrial lighting, over 85% reflectance

Unique feature of this new industrial fluorescent lighting fixture lies in the ribbed construction of the contoured reflector. It has five heavy die-formed ribs every 48 inches. When hung in continuous rows, the uniformity of the reflectors assures straight, even rows. The fixture can also be hung individually. The reflector has an all white porcelain finish. Other metal parts are protected by a five stage rust inhibiting treatment before finishing with baked white permalux. A rotating spring-loaded reflector latch makes possible fast removal for cleaning. Stirrup holds reflector securely. *Smoot Holman Co.*

... FOR MORE DETAILS, CIRCLE NO. 287

RECOVER RUBBER ROLLS?

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Rubber rolls have a tough job to perform and are highly individualized for each industrial process. Here at Goodyear, we have a complete division devoted to recovering rubber rolls to specification for such diverse industries as paper, steel plate processing, graphic arts, and food processing.

We also manufacture precision industrial rubber goods of ALL types on a custom basis, adapting special formulae to your product requirements. Regardless of your industrial rubber problem... we'd like to talk about it.

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TANK AND SUMP DRAINS

... frees compressor receiver tanks of sludge

Models 5100-4 and 5101-8 float operated tank and sump drains are designed to collect and automatically discharge large volumes of moisture and sludge from compressed air systems. Flow of air through the unit is not required for operation and contamination is automatically drained as long as 10 psi air pressure or more remains in the air system. The 5101-8 is capable of collecting and discharging up to 500 gal. of liquid contamination per hour. *Wilkerson Corp.*

... FOR MORE DETAILS, CIRCLE NO. 288

REVERSIBLE 1/2-in. SPECIAL DRILL

... with fool-proof switch, for diverse applications

Equipped with a trigger switch for on-and-off control, this drill also has a special fool-proof switch by which full power can be applied to turn the auger in reverse, so it backs itself out of the drilled hole. Trigger switch must be released before reversing switch can be actuated. Drilling capacity is 1/2 in. in steel; 3/4 in. in masonry with special bit, 1 in. in hardwood with auger, and up to 1 1/2 in. in sheet metal with hole saws. *The Black and Decker Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 289

QUADRUPLE REDUCTION HELICAL SPEED REDUCERS

... in ratios of 106:1 to 660:1

Minimum noise, vibration and backlash in these new reducers is made possible with precision-ground gearing, giving an accuracy of tooth profile, profile spacing and surface finish never available before. Gearing and shafts are machined from alloy steel forgings; gear teeth are hobbled, hardened and precision ground, and oversize anti-friction bearings used throughout give high efficiency, correct center distances and proper alignment. *Philadelphia Gear Corp.*

... FOR MORE DETAILS, CIRCLE NO. 290

VARIABLE SPEED PULLEYS

... developed for original equipment use

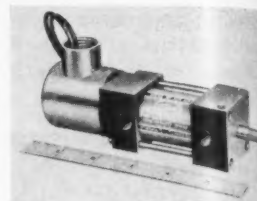
For low-cost replacement on existing equipment as well as for original equipment use, this new line consists of five sizes ranging from fractional to 1 hp., with speed ratios up to 2.8 to 1. The pulleys are as easy to install as an ordinary V-Belt drive, yet permit accurate adjustment over a wide range of speeds. *Lovejoy Flexible Coupling Co.*

... FOR MORE DETAILS, CIRCLE NO. 291

SOLENOID OPERATED CYLINDER

... light weight, compact, for tooling and automation

A new 1 1/2 in. bore, 150 psi. air, 250 psi. oil or water clamp type cylinder, with integral solenoid operated valve, has been designed for tooling and automated circuitry. The cylinder is available, spring return or double acting, in 1 in., 2 in., and 3 in. strokes from stock, with other strokes available. It is designed for 115 volt 60 cycle continuous duty



operation on temperatures up to 180 deg. F., with power consumption rated at 10 watts. *Sheffer Corp.*

... FOR MORE DETAILS, CIRCLE NO. 292

GRINDING WHEEL TREATMENT

... coats the pore surfaces with a parting medium

A new treatment for grinding wheels retards loading and functions as a dry coolant. Once the wheel has been impregnated by dipping in the new treatment, its pore surfaces throughout become coated with a parting medium. This solid lubricant prohibits the chip material from gripping the abrasive and bond surfaces with the usual affinity. *King Graphite Products, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 293



the mark of superior quality in...

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CENTRIFUGAL... the name that manufacturers recognize as a mark of superior quality in iron and steel centrifugal castings. They know that the **CENTRIFUGAL** plant is one of the largest and best equipped in the West... where better castings are produced consistently... at a better price.

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Strategic Central West Coast location on the north shore of Monterey Bay close to San Francisco and Santa Clara Valley yet uncongested.

A growing center for electronics, confections, clothing, metal products, novelties.

Selected increasingly by nationally prominent firms.

Rail and truck service—Five state freeways or highways—No smog—Mild year 'round climate—Lower costs—Stable population—Favorable labor situation—Finest living conditions and recreational opportunities for employees—Cordial community attitudes—Ample sites

For further information write Watsonville Chamber of Commerce, P.O. Box 470, Watsonville, Calif., Santa Cruz Chamber of Commerce, P.O. Box 921, Santa Cruz, Calif., or fill in Reader Service Card. 

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WESTERN INDUSTRY/FEBRUARY 1960

CENTRIFUGAL ACTION SWIVELOADER

... for faster, safer, economical boxcar loading

The Standard Duty and Hi-Type Swiveloader fills and trims the largest boxcars quickly while eliminating dust exposure for the operator. The standard unit mounts easily to wall or structural supports. No loading platform or gang plank is required. The operator swings the Swiveloader inside the boxcar door. The unit operates on a centrifugal action throwing principle. The Hi-Type unit is designed to be swung easily over three 20" high grain doors. With this feature, box cars can be spotted and the grain doors placed ahead of time. The operator can handle these duties while the Swiveloader is loading and trimming one end of a boxcar, thus speeding up the entire loading operation. *Stephens-Adamson Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 294

SOLENOID VALVES

... three way operation, increased exhaust speed

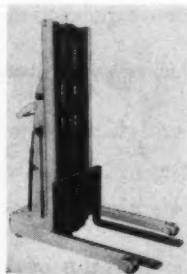
Unique three way solenoid valves provide quick exhaust speed performance for valves of this size. An oversized 1/4-in. diameter exhaust orifice is an integral part of the body, eliminating the need for connecting a separate quick bleed valve to speed up the exhaust cycle. The valves have brass bar stock bodies with 1/4-in. NPT connections. Discs are resilient and nylon providing tight seating on air, gas, water and light hydraulic oil up to 160 psi., depending upon the type of operation selected. Completely packless in design, only two moving parts are utilized and valves may be mounted in any position without affecting operation. The three forms of operation available are normally closed, normally opened, and universal. *Automatic Switch Co.*

... FOR MORE DETAILS, CIRCLE NO. 295

TELESCOPIC LIFT TRUCK

... load capacity to 1,000 pounds

Ruggedly constructed, this new telescopic lift truck carries the synchronized 12-volt heavy-duty system and has a lifting height to 160 inches. Due to low styling the unit has a special value for in-and-out travel from room to room, avoiding overhead obstructions. Another model contained in this series has a telescopic lighting height to 110 in. and a low door clearance of 78 in., is equipped with



pneumatic tires thus traveling fully loaded over rough surfaces. *Big Joe Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 296

ALL-STEEL UTILITY TRUCK

... one-hand maneuverability, stair climber

Exceptionally light weight, this sturdy one-piece utility truck can be handled with one hand, leaving the other hand free for opening doors, pushing elevator buttons and pulling door cords. Curved crossbars facilitate easy handling of round as well as square objects. The truck is furnished with semi-pneumatic wheels, available in 6, 8 and 10-in. sizes, and the load capacity, respectively, is 200, 250 and 250 lb. Material handling is made easier by the truck's upright position which allows bringing the truck's nose plate extra close to the load. *Fairbanks Co.*

... FOR MORE DETAILS, CIRCLE NO. 297



AIRMATIC MINIATURE AIR CYLINDERS

**compact, space-saving
and easily installed**

Wherever space is at a premium, Airmatic Miniature Air Cylinders are today's number one selection for aiding in dependable, maintenance-free automation.

For activating electrical contacts in test jigs and fixtures—as miniature air vices—in automatic work for feeding, ejecting, soldering and many other applications. In fact, applications are limited only by the ingenuity of industry's design and production engineers.

Shown here, for example, is Airmatic No. C-1125 mounted on the gravity feed chute of a vibrating parts feeder.

The complete miniature line (with bores of 3/8", 1/2", 3/4", 1", 1 1/8", 1 1/2" and 2") are designed with thick brass tube walls.

Airmatic products lead the field in quality, delivery, price! Get your copy of "Airmatic Cylinders for Automation", Bulletin 91017, today.

AX-24

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79



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Sponsored by the Electrical Maintenance Engineers Association of California

The largest electrical industry show every presented in the West.

The Who's Who of the industry will display the latest in electrical and lighting equipment and accessories . . . YOUR opportunity to see over 200 manufacturers' products in one big showcase.

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ADDITIONAL FEATURE—Following each Industrial Lighting Session, there will be a 30 minute Micro Wave Lecture and Demonstration by Pacific Telephone Co.



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WESTERN INDUSTRY NEWS

THE INDUSTRIAL WEST . . . ON IT'S WAY

PLANTS • PRODUCTION • DISTRIBUTION • PERSONNEL

Greer Hydraulics to Move From NY To LA

LOS ANGELES—The head offices and engineering division of Greer Hydraulics, Inc., are being moved from New York during March to a plant now under construction at 5930 West Jefferson Blvd., here.

Organized in 1943, Greer has been a cross-continent operation, with headquarters at New York, a factory here on Telegraph Rd. for building accumulators, another plant on East Olympic, and sales divisions in Chicago and Dayton, Ohio. The accumulator factory on Telegraph Rd. will continue to operate in its present capacity.

According to *Don March*, general sales manager, the largest potential growth for the company is in Los Angeles, due to general industrial expansion in the area coupled with the fact that the majority of Greer's prime contractors are strung along the coast from San Diego to Seattle. Additionally, Greer purchases 60% of its component equipment locally and the remaining 40% through Los Angeles offices of plants scattered across the country.

The company's future home will have 50,000 sq. ft. and the firm anticipates absorption of approximately 250 engineers and technicians in the area.

B. F. Goodrich Chemical To Build at Watsonville

WATSONVILLE, CALIF.—Scientific Design Co., Inc. will design and construct a polyvinyl chloride plant here for B. F. Goodrich Chemical Co., a subsidiary of B. F. Goodrich Co.

The plant, which will incorporate the most advanced manufacturing facilities, is scheduled for completion this spring. B. F. Goodrich Chemical Co. will operate the plant using its own techniques and formulations.

New Sylvania Plant For Santa Cruz

SANTA CRUZ, CALIF.—Groundbreaking ceremonies took place January 20 for Sylvania Electric Products Corporation's new electronics plant to be constructed near Harvey West Municipal Stadium here.

Construction is expected to be completed by early summer on the plant which will employ about 250 persons.

Sylvania is currently manufacturing component parts in leased quarters at 440 Front St. The new plant, on a 26-acre site north of the stadium, will contain 32,000 sq. ft. and enable the firm to greatly expand its operation here.

Plant Manager *Gordon McClure* said the operation will be a major division of the firm and will manufacture parts used for electric brain devices in operation on the West Coast.

No. American Aviation Buys 80-Acre Anaheim Site

ANAHEIM, CALIF.—North American Aviation officials have announced the purchase of 80 acres of land near Orangewood Ave. and the Santa Ana Freeway. The \$640,000 purchase will be the site of another multimillion dollar facility.

The \$8,000 an acre land will be used for the company's Autonetics Div. Headquarters for the division is in Downey, with other branches in Fullerton, Whittier, Pico Rivera and Compton, Calif.

Food Machinery Renames Peerless Pump Division

SAN JOSE, CALIF.—Food Machinery and Chemical Corp. has announced that its Peerless Pump Div., with headquarters in Los Angeles, and seven associated operations in pump manufacturing and allied fields would operate under the new organizational name, Hydrodynamics Div.

Bliss & Laughlin Acquire Sierra Steel

LOS ANGELES—Acquisition of Sierra Drawn Steel Corp., the West's only independent cold finished steel bar manufacturer, by Bliss & Laughlin, Inc., the nation's second largest producer of cold finished steel bars, has been approved by directors of both companies, it was announced recently.

In making the announcement, *Arthur Lehr*, president of Bliss & Laughlin, said the acquisition is still subject to approval of Sierra stockholders. However, the holders of a majority of Sierra stock have already indicated approval of the transaction.

In acquiring Sierra, Bliss & Laughlin will become national in scope. Heretofore, the company has operated in the Midwest and East. Its headquarters plant is in Harvey, Ill., and it also has plants in Detroit, Mich., Buffalo, N. Y., and Mansfield, Mass. It will now stretch its activities to the Pacific states, taking over Sierra's headquarters plant in Los Angeles and Northwest plant in Seattle.

Fred J. Robbins, president and founder of Sierra, will become a vice president of Bliss & Laughlin and will head Western operations which will be known as Bliss & Laughlin—Sierra Drawn Division.

Lehr said the Sierra Drawn Division will continue operations under the same management and personnel.

Marquardt Establishes Facilities Engineering Div.

VAN NUYS, CALIF.—The Marquardt Corp. has formed a new facilities engineering division. Function of the organization is to provide the firm's experience and capabilities in the architect and engineering field to pursue facility and associated design projects for governmental as well as commercial installations.

GEARS FOR INDUSTRY
THE Lufkin LINE
OIL FIELD PUMPING UNITS

**CRYSTALBALLING
THE
SIXTIES**

In most every newspaper and magazine across the land, forecasts of the wonderful things to come in the '60's are reaching near epidemic stage.



V. J. Fawcett

Things like driverless automobiles. Sounds like a definite improvement. Accident reports may read like this: "Gin playing car pool in driverless air-car rams vulnerable bridge playing group in saucer-wagon at interchange. No injuries resulted since all occupants were wearing safety suits (whatever they are), but a 2-hour tie-up resulted while police unscrambled 208 playing cards."

And in the Sixties there will be more leisure, more automation, less work and more people. Not much change in people—as far as the forecasters can tell, they'll still be male and female.

There will be new toothpastes with mystery ingredients like mexacavity, noxenamelkwik, rexaset, hexatooth, and many more. And new filter smoking, like fantomfume, hexaclorafume, and asphyxanic.

But all is not change in the decade ahead. Good service, good delivery, craftsmanship, and highest grade materials will continue to be a part of every Lufkin Gear, every Lufkin Oil-field Pumping Unit, just as it has always been since 1902.

V. J. Fawcett

Lufkin FOUNDRY
A MACHINE COMPANY

... for more details, circle No. 50

Heller Machinery Open House



READY TO START demonstration of bolt header, William S. Heller, left, stands ready to punch "on" button. Carefully checking sump of Diac electrical discharge milling machine is Heller technician. Unit uses kerosene as a combination dielectric liquid and coolant.

LOS ANGELES—Several hundred representatives of Southland industry attended open house ceremonies held here last month at Heller Machinery Co., 7039 E. Slauson Ave., to announce arrival of new machine tools.

William S. Heller, president of the firm, has just concluded a far eastern and European trip to arrange import of a number of specialized tools including an electrical discharge machining device, a multi-purpose shear, and a bolt heading machine.

These machines, that had just been returned from the recent Chicago machine tool show, were demonstrated under power for visitors.

The Mubea plate and section shear with notching appliance can cut plate of unlimited length and substantial width, is capable of cutting bar, angles, shapes and rod steel.

The electrical discharge machine, the Mitsubishi Diac, is primarily intended for die sinking, accurate forming and grinding of tough metals, sintered tungsten, carbide and quenched steel.

Also under power was the Heller bolt header that is being built overseas to Heller Machinery specifications and sold under their brand name.

Automation Acquires Van Nuys Laboratory

MANHATTAN BEACH, CALIF.—Automation Industries, Inc. (formerly Automation Instruments, Inc.) has acquired all of the outstanding stock of the Ultrasonic Testing and Research Laboratory, Van Nuys, Calif., according to Corwin D. Denney, Automation's president.

"The Van Nuys firm is principally engaged in research and development work in the field of ultrasonics under prime contracts with the Air Force," Mr. Denney said.

Automation also operates plant facilities in Manhattan Beach and Menlo Park, Calif.; Tulsa, Okla.; Boulder, Colo.; and Columbus, Ohio, performing work in the fields of electronics, magnetics, chemical milling and industrial equipment leasing.

Esco Expands Hills-McCanna Distributorship

PORTLAND—The Electric Steel Foundry Co. has announced the distribution of the Hills-McCanna line of diaphragm valves in California with stocks located in Los Angeles and the San Francisco Bay Area. With the addition of California, ESCO's distributorship extends to all of the 13 Western states.

Johns-Manville Fiber Glass Division To Expand Plant

CORONA, CALIF.—By mid-1960 the Johns-Manville Fiber Glass Division plant here will be nearly doubled in size, according to F. H. May, Jr., vice president and general manager.

Construction specifications are now being issued to contractors for bids. A total of 91,200 sq. ft. will be added to the existing 105,000 sq. foot building.

Motorola to Expand Semiconductor Plant

PHOENIX—Motorola Inc. plans to substantially expand its semiconductor plant at 5005 E. McDowell Rd. here, according to an announcement by Dr. Daniel E. Noble, Motorola executive vice president for the Military, Semiconductor, and Communications Divisions.

Robert W. Galvin, Motorola president, and the company's board of directors met here recently and approved plans to increase the present facilities by at least 100,000 sq. ft. with the possibility that the new addition may be as large as 200,000 sq. ft. Dr. Noble estimated the cost of this expansion, including equipment, will exceed 3 million dollars over the next 18 months.

This will be the second major expansion of the company's semiconductor plant within two years. A 129,000 sq. ft. addition was opened last spring.

Dr. C. Lester Hogan, General Manager of the Semiconductor Division, stated that when the new plant is completed, employment in his division may increase two or three times the present level. The Semiconductor Division now has about 1500 people representing 40% of Motorola's total Phoenix employment. Some 1900 people are in the Phoenix plant of the firm's Military Electronic Division.

Metal Control Labs Buys Pacific Testing Labs

HUNTINGTON PARK, CALIF.—General Manager J. Dickason of Metal Control Laboratories, Inc., here, has announced the purchase of Pacific Testing Laboratories, Inc., of Van Nuys, Calif.

Pacific specialized in fatigue testing and research and the firm's equipment and personnel will be moved to the Metal Control Laboratories location in Huntington Park.

Alta Engineering Opens New Facility in Salt Lake

SALT LAKE CITY—New offices and a warehouse have been opened by Alta Engineering Co., dealer in air and hydraulics equipment, at 770 South 2nd West, according to Paul Locklin, president.

Kenneth Sigler, specialist in hydraulic and pneumatic circuits, will be district sales manager.

"This H-25 PAYLOADER®



saved costly plant revisions**

***Says Robert Knight, Foundry Superintendent of Sumner Iron Works, Everett, Washington:** "We had reached a point in our operation where greater plant efficiency and productivity were necessary—either through plant revisions or improved materials handling. We tried an H-25 'PAYLOADER' and it gave us the productivity and economies desired without installing conveyors and other costly materials handling equipment."

Sumner Iron Works has expanded rapidly through the years, taxing its foundry facilities considerably. Finally it reached a point where increased foundry productivity was absolutely essential and material handling improvements were required. Before taking this costly step, it was decided to see what a "PAYLOADER" could do to step up production within existing facilities.

The H-25 "PAYLOADER" was placed in service, bringing in sand from storage bins, filling the mixer hopper, and also dumping sand directly into

the molds. Formerly this was a slow, laborious wheelbarrow and shovel job with long man-hour requirements. Now the "PAYLOADER" will pay for itself very quickly in savings alone—it has increased foundry production and has eliminated the requirements for other changes.

Whatever your material handling problem may be, there is a proper size "PAYLOADER" to do the job most efficiently.

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83

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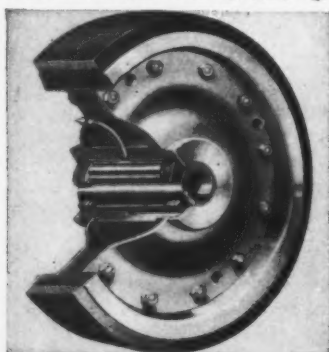
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54

Western Backing Plant Underway



CULVER CITY, CALIF. — Ground was broken recently for Western Backing Corporation's new home office and processing plant on a 13-acre site located on Hazard St., across from the Westminster City Hall, Westminster. This is the first of several plants to be erected in the new industrial development area of Westminster.

This 42,000 sq. ft. plant will have access to major railroad lines and the new San Diego Freeway; 4,000 additional sq. ft. will be used for research, development and executive offices. Chemical mixing and blending will

take place in a separate building approximately 2,000 sq. ft.

Western Backing is engaged in processing and reinforcing of fiber glass used in such industries as aircraft and missile, pleasure boat, luggage manufacturing, wall partitions, and space suit fabrication, as well as general industrial products.

Now located in Culver City, the company expects to occupy the new premises in mid-summer, employing approximately 150 personnel by the end of the year.

New Equipment Firm Underway At Carlsbad

CARLSBAD, N. M. — Construction has been started on the new \$500,000 plant of Southwest Engineering and Machinery Corp. here. The new company will specialize in re-building heavy equipment as well as the design and fabrication of special equipment.

Joe Dilaconi, formerly with International Mineral and Chemical Corp. heads the new company as its president. General superintendent will be L. H. Bunnel, recently retired as maintenance superintendent for the Potash Corp. here. Completion of the plant is scheduled for March 30, 1960.

Canning Plant To Add Unit

WALLA WALLA, WASH. — A modern belt freezing unit capable of freezing 120 tons of products daily is planned for installation by Umatilla Canning Co. at Milton-Freewater.

Company officials estimate that this phase of a planned expansion program will involve an expenditure of about \$250,000. This project is the first phase of a long-range program calling for relocation of freezing facilities and expansion of frozen asparagus and frozen corn production.

Inks Industrial Park Acquires 72 Acres

SACRAMENTO, CALIF. — Inks Industrial Park here has acquired more than 72 acres of property and made three sales involving more than 37 acres, according to Jess C. Wilson, Jr., Sacramento manager of Coldwell, Banker & Co., who reported these purchases by Inks Brothers and associates, owners of the park.

Sales of industrial park property included 20 acres to the Thys Co. and 11 acres to Lloyd Transportation Co. The Thys Co. plans to build a foundry on the site and the Lloyd Transportation Co. will erect a truck terminal.

Chiksan Export Co. Becomes Chiksan International

BREA, CALIF. — Chiksan Export Co., formerly a subsidiary of Chiksan Co. here, has become a division of the parent firm and has been renamed Chiksan International, according to the president of both companies, H. J. Hagn. The change was made, according to Hagn, to reflect Chiksan's broadened activities in international trade. Chiksan Co. manufactures swivel joints, tank car and tank truck loading arms, and barge and tanker loading systems.

Standard Oil Plans Refinery In Hawaii

HONOLULU—Island residents late this year will be using the first petroleum products ever refined locally.

By November Standard Oil of California expects the partially completed refinery at Barber's Point to be ready to begin manufacturing nearly half of the 21 finished products it eventually will be turning out.

The first stage products will include kerosene, diesel fuel, solvent such as paint thinners and cleaning fluids, stove oil, straight run gasoline, light fuel oils, jet fuels and possibly asphalt.

The end of the first stage, November, will see the completion of treating plants, pipelines, marine loading facilities, a crude still, tanks and lab-office buildings.

To cost about \$57 million, company officials estimate, the refinery is being designed to serve all mid-Pacific markets as well as the State of Hawaii with the 21 finished products. The entire refinery is scheduled for completion by mid-1962 and will employ at least 200 persons.

Western Gear Ships Rolling Mill Drive

BELMONT, CALIF.—Western Gear Corp. shipped the largest rolling mill drive of its type ever manufactured in the West, it was announced recently by *W. E. Hoard*, general manager of the firm's Industrial Products Div. here.

The drive, a combination pinion stand and speed reducer, weighs nearly 10½ tons and is designed for 1000 hp. application. It will be installed as the drive for the aluminum foil rolling mill of one of the major tobacco companies, in Winston-Salem, No. Carolina.

Distributor for Durant

SAN FRANCISCO—Pacific Coast Instrument Co., Inc., 256 Mission St. has been named a stocking distributor for instrument and industrial counters made by Durant Manufacturing Co. of Milwaukee, Wis. Pacific Coast Instrument, headed by *Fred Murdock*, will work with Durant's Northern California Sales representative, Transmission Engineering Co., San Francisco.

American Bechler Names Three Western Reps

LOS ANGELES—The newly formed American Bechler Corp. with headquarters at Stamford, Conn., has appointed Western representatives for its line of Swiss automatic bar machines.

The Denver area will be represented by Geoffroy-Lane, Inc.; the Southern California area by Russell, Holbrook & Henderson and Northern California by Merryweather-Strasman Machine at San Mateo.

New Firm To Distribute Westfalia Clarifiers

SARATOGA, CALIF.—According to an announcement by *J. Spiekermann*, general manager of Centrico, Inc., Englewood, N. J., the newly organized firm of Moffett and Stollenwerk, Inc., here, has been appointed to handle sales of Westfalia centrifugal clarifiers in the wine and juice industries.

Sales of Westfalia Centrifugals in the West Coast area will be under the supervision of *Bob Moffett*.

GREEN-PENNY



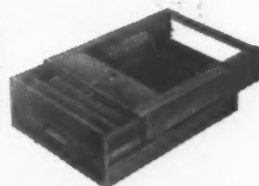
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Aeroquip's Marman Div. Completes Plant



LOS ANGELES — Completion and occupancy of a new development engineering center has been announced by **Don T. McKone**, vice president and general manager of Aeroquip Corp., Marman Div., 11214 Exposition Blvd., here. The new 11,000 sq. ft. addition includes complete facilities for for engineering, design, research, test lab and development fabrication. The new addition brings the division's total plant area to approximately 100,000 sq. ft.

Mr. McKone pointed out that increasing development work for the aircraft and missile fields necessitated the new facility. Marman is a leading producer of clamps, joints, bands, straps, bellows and duct assemblies,

which require complex environmental testing procedures for qualification on jet aircraft and missile systems. In addition to providing space for lab build-ups and subsequent testing of ducting assemblies, the new center will permit a 25% increase in the current engineering staff. The Marman plant now employs more than 600 persons.

Dempster-Dumpster Names Portland Rep

PORTLAND—The Top Line Equipment Co., materials handling specialists at 5210 S. W. Corbett Ave., here, has been appointed exclusive, franchised dealer in Oregon for the Dempster-Dumpster System of mechanized waste disposal and materials handling.

Clark Rental Names Four Western Reps

OAKLAND, CALIF. — A subsidiary of Clark Equipment Co., the Clark Rental Corp. has named four Western dealers to handle long and short term rental contracts for Clark's line of fork trucks and other materials handling equipment.

Dealers announced include Gray Lift, Inc., 1905 Mary St., Fresno, Calif.; Robert H. Braun Co., 5519 Jillson St., Los Angeles; Lifton, Inc., 6601 San Leandro St., Oakland, Calif., and Liftco, Inc., 1921 Minor Ave., Seattle.

General Controls Opens San Diego Office

GLENDALE, CALIF.—Establishment of a San Diego area resident office by General Controls Co. has been announced by **J. F. Ray**, vice president in charge of sales.

Supervised by **Don Wolf**, new field representative for San Diego, the office provides service for original equipment manufacturers' sales outlets as well as for the aircraft and electronics industries.

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WESTERN INDUSTRY/FEBRUARY 1960

Ryan Aeronautical Acquires Aerolab

SAN DIEGO, CALIF.—Aerolab Development Co. of Pasadena, Calif., specialist in aerophysics research, has been acquired by Ryan Aeronautical Company, here, *T. Claude Ryan*, President, announced recently. Aerolab will continue operations at Pasadena as a wholly owned Ryan subsidiary.

Aerolab has been identified in scientific and military circles for its unique multi-stage high altitude sounding rockets and space probes, and for rocket-fired free flight testing of dynamically similar models.

The Ryan Aerolab operation will be under direction of *E. G. Uhl*, vice president, technical administration. Uhl joined Ryan six months ago after many years as vice president of the Martin Co. and manager of its Missile Div. at Orlando, Florida.

Construction on Asphalt Plant Begins in New Mexico

ALBUQUERQUE, N. M.—Thunderhead Oil & Gas Co. has begun construction on its \$100,000 asphalt plant at 2030 Second N. W., according to *Carlos Bachechi*, president.

Childers Manufacturing Co., Inc., here has started a \$50,000 installation of a coiling and heating system to permit heated asphalt delivery at all times.

Beckman Acquires Two Southern California Firms

FULLERTON, CALIF.—Beckman Instruments, Inc., in an expansion of its product lines, recently acquired assets of Harold Kruger Instruments of San Gabriel, Calif., and Tool-Lab Inc. of Escondido, Calif. Kruger makes chemical analysis equipment and other products. Tool-Lab produces precision electric meters.

Western Electric Co. Plans Supply and Repair Plant

SALT LAKE CITY—The Western Electric Co. has taken option on 16.5 acres in Industrial Center and plans to build a 125,000-square-foot building to supply and repair Bell Telephone equipment, according to *A. J. Boesch*, manager of Western Electric at Denver, who was here completing negotiations.

Construction will begin in 1960 with completion scheduled for 1961. Total investment will be some \$2 million.

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Maintenance Time: 40 Seconds. If it now takes your maintenance crew more than a couple of minutes to service an ordinary trap, you're throwing away valuable time. This SARGO Thermo-Dynamic can be cleaned, blown out if necessary, and reassembled on the line in as little as 40 seconds.

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First Northern California Machinery Show Opens March 17 at Oakland

SAN FRANCISCO—Members of the wood and metalworking industries in Northern California will have an opportunity to see the newest in power metal and woodworking equipment under actual operating conditions at the first Northern California Machinery Show, March 17-19 at the Exposition Bldg., 10th and Fallon Streets, Oakland. Free tickets of admission are available on request from Haven Machinery & Supply Co., 1072 Howard St., San Francisco.

Several scores of manufacturers will exhibit equipment, among them, Armstrong Blum Mfg. Co., Armstrong Bros. Tool Co., Bateman Iron Worker Co., Black & Decker Mfg. Co., Bradley Enterprises (Lesto Power Tools), Decora Mfg. Co., Delta Div. of Rockwell Mfg. Co., Disston Div. of H. K. Porter Co., Hisey-Wolf Co., Ingersoll-Rand Co., Minnesota Mining & Mfg. Co., Porter-Cable Machine Co., Rotex Punch Co., Sheldon Machine Co., Simonds Abrasive Co., Simonds Saw & Steel Co., Skil Corp., Standard Tool Co., Stanley Electric Tool Div. of

Stanley Works, Supreme Chuck Co., U. S.-Burke Div. of Cincinnati Mfg. Co., Wells Mfg. Co., Whitney-Jensen Mfg. Co., Wyco Flexible Shaft Co., and others.

This new type of equipment exposition is expected to draw thousands of visitors. The first two days of the show will be open free to the industries only; on Saturday, March 19, the public will be admitted to the show.

The entire exposition is being arranged and sponsored by the Haven Machinery & Supply Co. as a celebration of the firm's 25th anniversary as a distributor of industrial and construction machinery. From its 1935 founding in Oakland, the Haven firm has expanded to include branches in Fresno, Sacramento, San Francisco and San Jose.

The show will be open from 1 p.m. to 10 p.m. on March 17 and 18, with buffet supper from 5:30 to 7:30 p.m. for industry members; on March 19 the public will be admitted from 10 a.m. to 10 p.m. Prize drawings will be held at intervals during all three days.

Bivans Forms Conveyor Firm In Southern California

LOS ANGELES—Formation of Bivans Conveyor Co., a California corporation with headquarters at 2420 Eads St., was announced recently by Ronald B. Colson, executive vice president.

The new firm, which will undertake design, fabrication and installation of standard and special industrial conveyors, whether belt or gravity, permanent or portable, is affiliated with Bivans Corp., Los Angeles, manufacturer of automatic cartoning and carton conveying machinery.

WESCO Moves Into New Arizona Headquarters

PHOENIX—Westinghouse Electric Supply Co. has moved its Arizona headquarters into a new building at 2001 N. 23rd Ave., here.

The new structure has 25,000 sq. ft. of floor space and includes office, warehouse and display areas. A one-story structure, the warehouse roof is supported by one supporting steel beam and three vertical columns.

American Can To Build Plant At Astoria

ASTORIA, OREGON—American Can Co. has announced plans for construction of a plant in Astoria to make cans for the seafood packing industry.

Construction will begin shortly on a 1½-acre tract on Marine Drive. The plant is to be completed in time to produce containers for the major 1960 seafood packs, according to William C. Hatfield, Oregon sales representative for the company's Canco division.

Hatfield said the Astoria plant will have about 55,000 square feet of floor space and will be capable of producing 100 million cans a year.

Utah Plant of Hammond Iron Works Changes Hands

PROVO, UTAH—The large Hammond Iron Works steel fabricating plant here is one of the five sold recently to the Pittsburgh-Des Moines Steel Co., which has nine plants from Baltimore, Md., to the West Coast. About 130 persons are employed at the facility here.

Crown Zellerbach Earnings Up 18%

SAN FRANCISCO — Crown Zellerbach Corp. announced 1959 earnings from operations of \$39.3 million, an increase of 18% over 1958. Earnings per share came to \$2.76, compared with \$2.32 the previous year.

In addition the company realized \$2.9 million from the sale of timber in eastern British Columbia, making the total income for the year \$42.2 million. Net income from operations of \$39.3 million for 1959 was the third highest in company history and was exceeded only during the record years of 1955 and 1956.

Production of paper and paperboard in 1959 also established a new company record of 1.8 million tons, 12.5% higher than in 1958 and 7.5% above the previous record made in 1956.

Missouri Refractories Becomes Kaiser Div.

OAKLAND, CALIF. — The Missouri Refractories Co., 4555 Pacific Blvd., Vernon, Calif., has changed its name to Kaiser Refractories & Chemicals Div., according to W. E. Daugherty, district manager.

The change in name reflects the recent merger between Mexico Refractories Company, Mexico, Mo., and Kaiser Aluminum & Chemical Corp., here, both parent organizations. Missouri Refractories has been in business since September, 1951, when it was organized to take over the operations of a distributing organization.

As a district sales office and distributing warehouse of Kaiser Refractories & Chemicals, the organization will continue to serve Southern California and the southwestern states with a full line of refractories, insulating materials and masonry saws and blades, Daugherty said.

Columbia Rubber To Expand Facilities

MILWAUKEE, ORE. — The Columbia Rubber Mills have announced plans for complete remodeling of some newly acquired property to be finished by early spring. The company, which will employ 10 persons to begin with, manufactures a variety of rubber gaskets and also does custom manufacturing of rubber products.

Frontier To Build Farm Machinery Plant

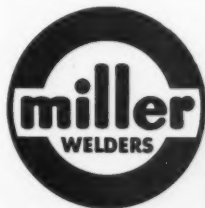
WALLA WALLA, WASH. — Plans for construction of a \$100,000 plant for Frontier Machinery Co. near the City-County Airport were announced recently by Clarence Braden and the partners in the firm, Gale House, Bob Lathrop and H. W. Thompson.

To employ about 30 persons, Frontier Machinery has the John Deere line for Southeastern Washington and Northeastern Oregon.

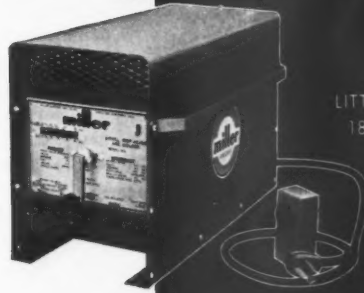
Union Pacific Installs Microwave Radio System

LARAMIE, WYO. — Start of construction on an extensive microwave radio installation has been announced by Union Pacific Railroad.

The System is being installed between Omaha, Nebr., and Laramie, a distance of 563 miles, and ultimately will become systemwide. There will be 18 repeater stations strung out at intervals of from 10 to 35 miles between the two points.



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BIG TWIN combination ac-dc welders work from single phase service — deliver new convenience and economy. Two a-c amperage ranges of 20-125 and 60-290 plus two d-c ranges of 18-100 and 65-290 amps master nearly every welding requirement from light gauge metal to structural pieces. Movable shunt type transformer affords infinite current adjustments. Other features include: Horizontal design for easy stacking; weather-resistant construction and Class B insulation; Miller-built semi-metallic rectifier for best d-c welding; high open circuit voltages and new weld stabilizer. This is THE all-time, all-around welder!

LITTLE TWIN ac-dc combination welder has two a-c amperage ranges of 20-115 and 60-180 plus one d-c range of 40-150. Operating from single phase service, this Miller model incorporates many design and construction features usually found only in large industrial types. These include really rugged construction, forced air cooling, new Miller semi-metallic rectifier, movable shunt type current control, new weld stabilizer and open circuit voltage in abundance. Power factor correction is available on both models. Complete specifications on either model will be sent promptly upon request.

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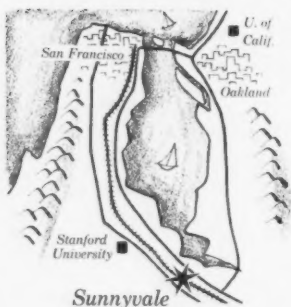
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90

New Krusen Wire & Steel Co. Warehouse



LOS ANGELES—Rainy weather did not delay construction of this new \$200,000 warehouse for the Krusen Wire & Steel Co. The 25,000 sq. ft. warehouse building is located on 1¼ acres at 7271 Paramount Blvd., in Pico Rivera, developed by Central Mfg. District, Inc. General Contractor was Morgan Lupher & Co. of Los Angeles.

Pacific Iron & Steel Merge Into Standard Rail

LOS ANGELES—Carl L. Lodjic, president of Pacific Iron and Steel Corp. here, announced that his company has been merged into Standard Railway Equipment Mfg. Co. of Chicago, a 70-year old producer of freight car roofs and now a leading outboard boat maker.

Pacific Iron, established in 1919, is a fabricator and erector of structural steel for industrial and commercial buildings and is the sole producer of the newest addition to airline terminal equipment, the "Jetway," for loading and unloading jet passengers.

Mr. Lodjic said the merger of the two companies was negotiated through the sale to Standard of all of the operating assets of his company. The amount of cash involved was not disclosed. Pacific Iron, which was wholly-owned by its officers and employees, has its offices and plant in Lynwood on an 11½ acre site. A second fabricating plant is operated at Ogden, Utah, on a 23-acre site. The Ogden plant has also been merged into Standard Railway.

Mr. Lodjic said that he and other officers of Pacific Iron will continue to manage the company as a subsidiary of Standard to be known as PI Steel Corporation.

Mears Electric To Get New Portland Facility

PORTLAND—Mears Electric Controls Co., presently located on Swan Island, is building a \$135,000 factory in the Tektronix industrial park in the Beaverton area.

Mears, which makes thermostats and circuit breakers, will have about 20,000 sq. ft. of office and manufacturing space in the new facility.

Siegler Establishes Four New Sales Districts

LOS ANGELES—The Siegler Corporation's Holly-General Div. has established four new sales districts to handle the expanding distribution of the company's products, according to Robert K. Miller, president of Holly-General.

A vice president has been appointed to head each of the new district sales offices. Heading the San Francisco district office is Earl C. Hefner. This district encompasses northern California, Oregon, Washington, Idaho, Montana and northern Nevada. The Los Angeles district, which includes southern California, southern Nevada, Colorado, Wyoming and Utah, will be headed by John F. Droge. Jackson L. Garner will be in charge for San Diego County and Arizona; and Leroy D. Nutter will be in charge of the Dallas office which covers New Mexico.

Holly-General, with plants in Pasadena and Burbank, Calif., is a leading producer of wall furnaces, central forced air heating, water heaters and air conditioning.

Feed Mill Piling Job Under Way

PORTLAND—Excavation of the basement for the western Farmers Association's \$1,500,000 feed mill on Mocks Bottom has been completed, and the General Construction Co. of Portland a sub-contractor, is driving foundation piling.

In addition to the mill, the project will include two warehouses, a boiler house, shops, office space, scales, and truck and rail car unloading devices. The installations will cost about \$1,500,000. The mill is scheduled for completion about Sept. 1, 1960.

Longview Fibre Plans Expansion

LONGVIEW, WASH.—The Longview Fibre Co. has placed an order for the firm's ninth paper machine, major item in a \$5 million improvement and expansion project, according to R. P. Wollenberg, vice president in charge of operations.

The machine, designed to produce a 14-foot-wide sheet of lightweight paper or semi-chemical corrugating medium paper at a rate of 125 to 150 tons per day, has been ordered from Beloit Iron Works of Wisconsin.

Contracts for installation of the machine and for auxiliary equipment will be let to firms in the Pacific Northwest.

New National Headquarters For Sliding Door Institute

LOS ANGELES — Due to continued increases in program activity and a staff addition, Sliding Glass Door & Window Institute National Headquarters Operations Office, formerly located in Monterey Park, Calif., has moved to new and larger offices in Los Angeles, SGD&WI Executive Secretary, *Donald Hassis* reports.

According to Hassis, membership growth, more direct member services and extensions of overall national activity during the two years since the Institute inaugurated its new business-action program have necessitated expansion of all operational facilities, while at the same time SGD&WI effort toward specifications, standardization problems and industry information have been highly successful. New address for the association is 6132 Whittier Blvd., Suite B, here.

Oregon Metallurgical To Furnish Metal

ALBANY, OREGON—Oregon Metallurgical Corp., Albany, has been awarded a \$430,000 contract to furnish high purity vanadium, *Stephen M. Shelton*, president, reported.

The contract is one of the largest purchases of the metal in high purity form ever made in the United States.

Oregon Metallurgical is the largest supplier of the metal in high purity form in the free world. The firm reduces several other rare metals including titanium, zirconium, tungsten and molybdenum.

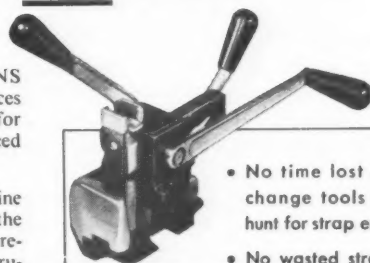


Faster Production Line Strapping... USING ONLY ONE TOOL!

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FAST & EASY TO USE. This new line of A. J. Gerrard Stretcher-Sealers does the job faster, easier, wherever strapping is required—closure of television sets in corrugated cartons, strapping export boxes, palletizing cartons of nails, packaging of screw products.

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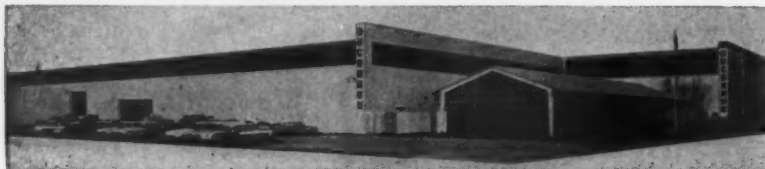
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Ducommun Expands Metals Service Center



BERKELEY, CALIF.—Complete inventories of carbon steel plate, sheets, bars and structurals have been added to Ducommun Metals & Supply Co.'s expanded Northern California plant at 2550 Seventh St., here. The plant is now a completely integrated metals service center serving Northern California industry with a full line of carbon and stainless steels, aluminum, and brass and copper. The expansion includes the construction of two new 80-ft. wide warehouse bays. A total of 70,000 sq. ft. of warehouse space has been added, expanding warehouse storage space to 110,000 sq. ft. The offices have been enlarged by 4,000 sq. ft. The warehouse has been completely equipped with modern shearing, sawing, torch cutting, grinding and material handling equipment.

Hooker Chemical Consolidates Facilities

LOS ANGELES—The combined Los Angeles sales offices of both the Durez Plastics and Western Chemical Divisions of Hooker Chemical Corp. here have been moved to 6277 East Slau-son Ave., here.

These offices are to be consolidated with modern warehouse facilities for the company's products in the new warehouse of Interamerican Warehouse Corporation at this location, where all company stock for the area will be stored.

The announcement was made by Evan E. Graham and John K. Gallagher, district sales managers for the respective divisions.

New Denver Factory To Make Pick-up Coaches

DENVER, COLO.—Joseph W. Ekstrom, owner of the Colorado Coach Co., 491 W. Mississippi Ave., has announced that he will open a factory for construction of pickup coaches.

He has purchased four buildings with 25,000 sq. ft. of space to begin production. One building will be devoted exclusively to repair work on trailers and mobile homes.

The Eagle Coach Co., as the new firm will be called, will carry a full line of trailer fixtures and parts such as small sized appliances and fixtures. The firm plans to turn out about 15 coaches a week when full production is reached in February.

New Introductions By Curtiss-Wright

SANTA BARBARA, CALIF. — A new VTOL aircraft that combines characteristics of a jeep and a helicopter was shown for the first time recently at a press conference held at the Santa Barbara Division of Curtiss-Wright Corp.

Designed to prove the feasibility of the much-discussed type of vehicle, the craft is 17 ft. long and 16 ft. wide, with four two-bladed propellers powered by a 425 hp. gas turbine engine. Turbine exhaust is directed backward providing much of the required thrust. Directional control is by a pilot's stick, a collective pitch lever and foot pedals.

Another product of the division unveiled at the conference was the 30-lb Turbomite, said to be the world's smallest gas turbine engine. A transonic test vehicle used in the warhead nose cone of the Atlas missile was also shown. This 18-ft., 6,000-lb. "bird" was designed to enable the cone to simulate exactly the re-entry characteristics of the 6,000-mile Atlas flight.

The Santa Barbara Division, one of the West's most advanced research and development centers, came into being in 1958. The Dart anti-tank missile, the hypersonic test vehicle (HTV) and the Skydart, a rocket-powered target for testing missile effectiveness, are among projects that have originated there.

Ramo Wooldridge Leases NW Development Lab

PORTLAND — Thompson Ramo Wooldridge Corp. of Los Angeles has leased facilities of the Edwards Development Laboratory in the Garden Home district.

The operation will continue in development of fuel systems for aircraft, under direction of Donald T. Shiley, resident supervisor.

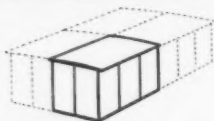
Telecomputing Purchases Monrovia Aviation Corp.

LOS ANGELES — Telecomputing Corp. has purchased Monrovia Aviation Corp., subsidiary of Carrier Corp. and manufacturer of aircraft sub-assemblies and ground support equipment. Telecomputing is engaged in bidding on many projects that involve need for metal fabrication facilities, as provided by Monrovia Aviation.



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So. Calif. Edison Plans Data-Processing System

LOS ANGELES—The Southern California Edison Co. has announced that it will install an electronic data-processing system to handle the billing of 1,000,000 of its 1,600,000 customers in the Los Angeles area.

Edison also is considering the use of its computer to prepare for an anticipated customer-list expansion over the coming years, as well as for scientific calculations on engineering projects.

The fully transistorized computer, ordered by Edison from the Data-matic Division of Minneapolis-Honeywell, Boston, will be placed in operation in 1961 when the utility completes a new \$4,000,000 building in Long Beach, Calif., said J. K. Horton, president. The computing system, to be installed on the 10-story building's ground-floor, will be on display to passersby along the street.

Hathaway Instruments Makes Acquisition

DENVER, COLO.—The newly organized Hathaway Instruments, Inc., here has purchased all assets of the Denver-based Hathaway Instrument Div. of Hamilton Watch Co., including the million dollar plant at 5800 East Jewell Ave., opened in June 1957.

Donald J. Jones, a vice president of Hamilton Watch and manager of the plant here since 1957, is president of the new corporation. Jones said the Denver organization and its 200 employees will remain intact, also that plans already are drawn to expand the firm's activities in electronics manufacturing.

Plastic and Rubber Firm Announces Expansion

LOS ANGELES—Formation of a new Fluoro-carbon Division has been announced by the Plastic and Rubber Products Co. Located at 1642 W. 135th St., Gardena, the new division will fabricate standard O-Rings, V-Ring packings, teflon scraper rings, grommets and static face seals.

The division will be processing tetrafluoroethylene sheet, rod, tube and tape. Complete temperature and dust control measures will be incorporated into the new plant.



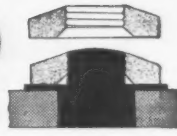
Flat end snubs against object and grips where rounded nose pliers would fail.



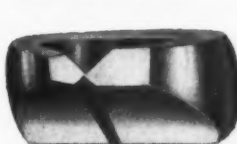
Deep cut-teeth provide secure grip. Curved sections have large, deep-broached teeth to grip pipe, etc.



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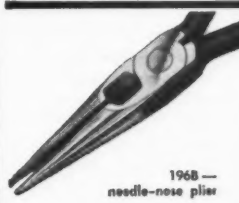
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Fuel Metering System Developed by PacAero

SANTA MONICA, CALIF.—Certification of an alternate fuel metering system for DC-3s and Super DC-3s has been announced by V. B. Benfer, president, PacAero Engineering Corp. The new system eliminates engine power failure due to the more common forms of carburetor icing, providing additional safety to the aircraft.

The pilot actuates the system when he observes any malfunction or power loss of the engine due to carburetor ice. An alternate path of fuel flow is immediately employed which bypasses the automatic metering control. Fuel flow is then manually metered by use of the mixture control, permitting generation of METO power. Other power settings are achieved by integration of readings from the tachometer, manifold pressure gauge and fuel flow meters. Application of carburetor air heat then removes the ice and prevents recurrence of icing.

Lockheed Wind Tunnel

SAUGUS, CALIF.—California Division of Lockheed Aircraft Corp. reports that construction is well under way on the \$5,000,000 supersonic wind tunnel and high-altitude test facility being built near U. S. Highway 99 in Rye Canyon. The tunnel is the first unit of the division's big research center on a 198-acre site.

Western Research and Testing Laboratories Reflect Increased Industrial Activity

LOS ANGELES—More than 750,000 man-hours of research and testing, performed by consulting laboratories on behalf of business concerns with scientific problems to be solved, were chalked up in 1959 by the 20 Western division members of the American Council of Independent Laboratories, according to J. Dickason of Los Angeles, div. chairman.

"The amount of work performed by our member laboratories, who range geographically from Vancouver, B. C. to Albuquerque, N. M., is one index of industrial activity of the region and of the communities where the laboratories are located," Dickason explained. Nine of the labs are in the Los Angeles area, three each in San Francisco and Phoenix, and one each in San Diego, Portland, Seattle, Albuquerque and Vancouver, B. C.

"Among the most active fields in the West," said Dickason, "are metals and construction. Space-age demands are throwing 'miracle' alloys in the limelight. Builders of homes, skyscrapers, factories, schools and freeways are hard put to keep up with the deluge of westward bound population."

Some outstanding developments of the past year as reflected by the laboratories' operation are as follows:

An explosion release mechanism for ejecting space capsules from earth satellites will mean better "fishing" by recovery planes.

Pre-stressed concrete is proving a surprising competitor to steel and wood for heavy construction. Under 11 tons of pressure, a 98-foot beam of this material bent 16 in. and then came completely back into place without a trace of crack or distortion.

The beauty of floor tiles and wall panels of "particle board" (Ed.: generic name, not proprietary), a new wood scrap product, is due to give vinyl and asphalt tiles a hard run.

Prospecting isn't dead. Hundreds of drill cores are coming in from people preparing to develop new borax deposits, spurred by newly-realized possibilities of boron in the propellant and specialized chemical fields. Large companies hopefully flood labs with samples of rock believed suitable for construction materials.

California and Arizona cotton fibers are rapidly gaining greater acceptance by textile manufacturers, as indicated by a heavily increased load of lab testing.

Diesel buses and taxicabs, although they may smell and smoke when out of adjustment, are found practically smog-free when properly operated. The exhaust won't react with sunlight, hence has no smog-forming potential.

In the recent cranberry crisis, independent labs had the facilities to get on the job quickly and supplement the government's analytical services, where inspection and testing otherwise would have broken down.

Metal alloy testing is heading through the sonic barrier. In two minutes a new machine can determine the precise amount of each element in an alloy, doing the work of 20 chemists and saving 6 to 8 hours.



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CEC - Bell & Howell Merger

PASADENA, CALIF.—Directors of Consolidated Electrodynamics Corp., electronic and instrumentation manufacturer, and Bell & Howell Co., Chicago photographic equipment firm, have approved a merger.

Picco Industries Announces Expansion

EL MONTE, CALIF.—Picco Industries, manufacturer of investment castings and powdered metal parts, has announced expansion and consolidation of their facilities at 1729 N. Chico Ave., here.

A 5600 sq. ft. building has been added to the original plant facilities and is housing the powdered metal department that was moved from a former site in Sierra Madre, Calif.

Additional floor space in the new building will be available for engineering department use and for assembly operations. Those interested in touring the new facilities may make arrangements by calling Cumberland 3-7246.

Horkey-Moore Announces New Plastics Division

TORRANCE, CALIF.—Formation of a plastics division as a new unit of Horkey-Moore Assoc. has been announced by the firm's president, Edward J. Horkey.

The new division will be devoted to the application and extension of reinforced plastics technology to missiles, aircraft and space vehicles, as well as commercial and industrial products.

Carl S. Seynold will head the new division which is scheduled to employ 100 persons by the end of 1960.

Lightolier Opens New Headquarters

LOS ANGELES—New facilities of the Lightolier, Inc., were opened this month including a showroom, warehouse and custom factory.

Representing an investment in excess of \$500,000, the new quarters will enable the company to meet the growing demands of its residential, institutional and commercial lighting customers in the West.

New Firm for Marketing

LOS ANGELES—Marketeers, Unlimited, have announced the formation of their highly specialized company.

This new company will operate chiefly in the marketing of new products field in a consulting capacity. Part of the firm's services will be to find manufacturers for inventors and small firms not equipped to manufacture the new product.

James D. Volts is president.

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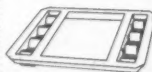
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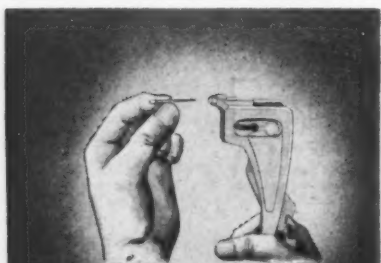
Sierra Electronic Announces Expansion

MENLO PARK, CALIF.—A division of Philco Corp., the Sierra Electronic Corp. will add 50,000 sq. ft. to its engineering and manufacturing facilities in the Bohannon Industrial Park section of Menlo Park, according to *Willard Feldscher*, vice president and general manager.

The addition will more than double the company's present plant capacity. The construction will be completed in April. Sierra manufactures communications test and power measurement equipment as well as custom test equipment and telemetry systems.

Jeffrey Mfg. Opens Branch

LOS ANGELES—A new branch office of the Jeffrey Mfg. Co. has been opened here at 2119 S. Atlantic Blvd. under the direction of *Keith Beachler*, formerly with the company's San Francisco district office at Burlingame, Calif. The firm also announced the appointment of *Peter Ambrosiani* to the post of manager of the mining division's Western territory with offices at the E. C. Horne Co., Denver.



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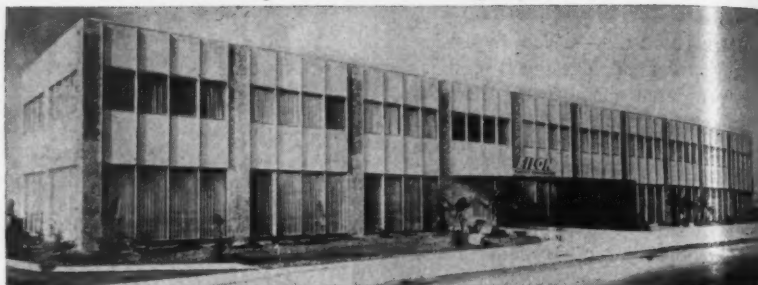
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96

Filon Opens New Fiberglass Plant



HAWTHORNE, CALIF.—Filon Plastics Corp. opened its new \$2,000,000 plant here in January. *David S. Perry*, Filon president, said the plant's new production lines incorporate several significant engineering refinements and will operate 30% faster than their old equipment. Founded in 1951, the first year of significant production of fiberglass reinforced plastic panels, Filon Plastics was a pioneer in the industry.

States Batteries Plans New Plant On SP Trackage

PORTLAND—States Batteries, Inc., has purchased a building at S. E. 25th Ave. and Raymond St. and will expand the structure to house its storage battery manufacturing plant.

The 200x200-foot plant site is located on Southern Pacific railroad trackage. The building measures 15,000 square feet and will be expanded to 20,000 square feet, according to *W. T. Foran*, general manager of States Batteries.

Recold Corp. Expands West Coast Facilities

HOLLYWOOD—Construction of a new 49,000 sq. ft. addition to its West Coast factory was announced recently by *H. T. Jarvis*, president of the Recold Corp. The new concrete and steel structure will be located adjacent to the present facilities at 7250 E. Slau-son Ave., Los Angeles, and will bring the total of the building to almost 170,000 sq. ft., including offices and warehouses.

Recold makes air-conditioning and refrigeration equipment.

Terry Coach Expands

BOISE, IDAHO—The Terry Coach Corp., El Monte, Calif., manufacturers of a complete line of travel trailers from 15 to 36 feet in length, will establish a plant here at Gowen Field.

Production operations are scheduled to begin in February said *Roy Clayton*, company president. *Edwin La Brie* will serve as general manager of both the Boise and El Monte plants.

Rail Welding Plant Under Construction

PUEBLO, COLO.—A rail welding plant is under construction adjacent to the Minnequa (Colo.) steel mill of the Colorado Fuel & Iron Co. by the National Cylinder Gas Division of Chametron Corp.

Robert A. Baer, head of National Cylinder's railroad equipment department, said the installation which will be completed in February, is the first of its kind anywhere which welds rails immediately following rolling.

William S. Boyce, general manager of railroad sales for Colorado Fuel, said the cooperative innovation will provide new improved service for railroad customers of the steel mill, only mill in the West rolling rail.

Fruehauf Announces Two New Western Facilities

LOS ANGELES—*A. A. Kearney*, vice president of the Pacific Coast Div. of the Fruehauf Trailer Co., has announced the construction of two new factory branches, one in Spokane to be completed in March, 1960.

The Spokane facility will have 70x200 ft. floor space and will be located at E. 5316 Broadway. The Seattle branch has 108x117 ft. building area, including modern office facilities.

New IBM Building

OAKLAND, CALIF.—A branch office building for International Business Machines Corp. will be constructed at the southeast corner of Grand and Staten avenues here, according to company officials.

Weyerhaeuser Opens Los Angeles Office

PACOMA—In a decentralization of the firm's Western sales region, the Weyerhaeuser Co. has opened a new sales headquarters in Los Angeles, according to A. J. Daley, manager of the Western sales region here.

In the newly created position of manager sales Southern District sales office is Carl Bastian. The district includes Arizona, California, and parts of New Mexico, Nevada and Texas. The new quarters are located at 3557 So. Hill St., Los Angeles.

Hewlett-Packard To Build At Loveland

LOVELAND, COLO.—Plans for construction by Hewlett-Packard Co. of Palo Alto, Calif., of a large electronics plant to engage in research, design and manufacturing of electronic measuring devices have been announced here.

The move is expected to provide a million dollar payroll by the end of 1961 with a development program due to extend through 1965.

The \$750,000 building is presently being constructed on 85 acres in the industrial tract south of the city. Some 300 persons will be employed within a year, and it is expected that more than 1,000 will be employed at the plant by the end of the development program.

Uranium Processing

RIVERTON, WYO.—The \$6 million uranium processing mill owned by Federal Uranium Corp. and Radorock Resources, Inc., has begun production, with a capacity of 522 tons daily, and will have a work force of some 100 persons.

The plant, officially known as the Federal-Radorock-Gas Hills Partners Uranium Mill, has a contract with the Atomic Energy Commission providing a guaranteed market for concentrates through 1966. It is the fourth processing mill in the state.

Howard Supply Distributor For New Blackmer Pump

LOS ANGELES—Lon Griffin, manager of Howard Supply Company's pump div., has announced that stocks of the new Blackmer proportioning pump will be carried in the firm's warehouses at Oakland, Bakersfield, Ventura, and Santa Maria, Calif., as well as Los Angeles.

Research Lab Planned By Simpson Lumber

PORTLAND—Plans for establishing a forest products research laboratory to serve all of the company's branches have been announced by Simpson Timber Co. of Seattle.

Located near Bellevue, Wash., the 20,000 square-foot facility initially will employ 40 scientists, technicians and project specialists.

It will be equipped to serve all the varied interests of the firm's branches, which include Simpson Logging Co. operations in Oregon and Washington, Simpson Engineered Wood Products Co. of Portland, Simpson Redwood Co. in Northern Calif., and Simpson Lee Paper Co. with plants in Washington, California and Michigan.

Arizona Divisions Combine

MESA, ARIZ.—Facilities of Talco Engineering Co. and Rocket Power, Inc., two divisions of the Gabriel Co., have been combined into a single operating unit. Rocket Power produces solid power propellants and rocket systems, while Talco specializes in cartridge-actuated devices and pilot escape systems for supersonic aircraft.

Irrigation Pipe Firm

STOCKTON, CALIF.—A 1½-acre-site at 1706 N. Broadway has been purchased by Rainmaker Pipe Co. for construction of a plant to manufacture irrigation pipe. With completion of the new facility, the firm will move from its present quarters at 2425 5th in Berkeley.

WEMCO Names Rep

SAN FRANCISCO—A division of the Western Machinery Co. of San Francisco, WEMCO has named the Lively Equipment Co. of Albuquerque to handle its complete line of aggregate processing equipment. The new distributor will cover all of New Mexico except the southern bank of counties along the Arizona and Texas borders.

Mobile Home Plant

BUTTE, MONT.—Dean Doak, president of the United Manufacturing and Development Corp. has announced that ground will be broken next spring for a \$500,000 mobile home and trailer manufacturing plant here. The corporation is capitalized at \$700,000 and has taken an option on a site adjacent to the Milwaukee Railroad lines.

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L. A. Napper
Bethlehem Steel



G. A. Withee
Rapistan



L. P. Sargent
P.I.E.

■ **Thomas M. Byrd** has been named assistant manager of Kaiser Steel Corp.'s Southern district sales office, Los Angeles.

■ **Donald F. Pennell** has been appointed vice president and general manager of Peterbilt Motors Co., Oakland, Calif., a subsidiary of Pacific Car and Foundry Co.

■ **W. P. Woods** has been named chief tool engineer for the Convair Div., San Diego, of General Dynamics Corp.

■ **Daniel E. Murphy** has been named director of the datalab division of Consolidated Electrodynamics Corp., Pasadena, a subsidiary of Bell & Howell Co.

■ **Philip H. Lawrence** has been named plant manager of the new B. F. Goodrich Chemical Co. vinyl resin and compound plant now under construction near Long Beach, Calif.

■ **John K. Rondou** is the new vice president and general manager of Computer-Measurements Co., Sylmar, Calif., a division of Pacific Industries.

■ **George Slajchert** is the newly appointed West Coast manager of industrial sales for the filter and process engineers divisions of The Eimco Corp., San Mateo.

■ **J. R. Johnson** has been elected president of Royal Industries, Inc. at Los Angeles. He replaces **M. L. Bengston** who resigned recently.

■ **Norval T. Grubb** has been named manager of the construction equipment division of Electric Steel Foundry Co. at Portland.

■ **Lowell A. Napper** has been appointed district engineer, fabricated steel construction, Los Angeles area at Bethlehem Steel Co., Pacific Coast Div.

■ **George A. Withee** has joined Rapistan of California, Inc., as division sales manager, Raymond Trucks.

■ **L. P. Sargent** has been named as import-export sales manager for Pacific Intermountain Express at Oakland.

■ **George C. Bless** has been appointed executive vice president of Morris P. Kirk & Son, Inc., Los Angeles.

■ **Lee Grimm** is the newly appointed Western division sales manager of Granberg Corp., Oakland, a subsidiary of American Meter Co., Inc.

■ **Charles C. Morgan**, formerly with the Geneva Works at Provo, Utah, has been appointed general manager operations for Columbia-Geneva Div. of United States Steel, San Francisco.

■ **Clifford J. Woodka** has been appointed to the newly created position of market research specialist, Motorola Inc.'s Semiconductor Products Div., Phoenix.

■ **Gerald D. Brennan** has been appointed a vice president and sales manager of Groark Steel Strapping Co., a division of A. J. Gerrard & Co.

■ **George H. Sinden** has been named head of the Los Angeles territory of the Industrial Diamond Div. of Engelhard Industries, Inc.

■ **William R. Rector** is newly named chief engineer, hydraulics division of Parker Aircraft Co., Los Angeles.

■ **Edward E. Anderson** vice president in charge of West Coast operations, Metal & Thermit Corp., is retiring.

■ **Fred G. Brear** and **William M. Vaughey** have been appointed to new executive positions in Kaiser Steel Corp.'s sales division at the general sales offices, Oakland, Calif.

■ **J. E. Ziegler** is new assistant manager, building products of the Pacific Coast division of Revere Copper and Brass, Inc. He will headquarter at Los Angeles.

■ **Larry S. Kern** has been appointed as sales representative of Neptune Meter Co., for the Northern California and Western Nevada territory.



P. H. Lawrence
Goodrich Chemical



J. K. Rondou
Computer
Measurements



George Slajchert
Eimco Corp.



J. R. Johnson
Royal Industries



G. C. Bless
Morris P. Kirk & Son



Lee Grimm
Granberg Corp.



C. C. Morgan
Columbia-Geneva Div.



C. J. Woodka
Motorola

■ **Spencer Gedney** is newly named service manager of Wilkerson Corp., manufacturer of compressed air products, Denver.

■ **Charles E. Mahoney** has been appointed controller of the Chemical Contour Corp., Gardena, Calif.

■ **Harold Miller** has been named general manager of the Cinema Engineering Div. of Aerovox Corp., at Burbank, Calif.

■ **Thomas C. Clark** is newly appointed general manager of Houston Fearless Corp.'s division located in Los Angeles.

■ **Harold Maine** is newly named sales engineer for the Pacific northwest area for Hyro-Aire Co. with headquarters in Seattle.

■ **William A. Price**, Concord, Calif., has been elected president of the Northern California Safety Society. He is safety supervisor at Shell Development Co.'s Emeryville Research Center.

■ **A. Elliott Merrill**, manager of military sales for the Boeing Airplane Co., has been elected Seattle president of the National Defense Transportation Assoc.

■ **George Grosvenor**, Pueblo, Colo., has been appointed superintendent of steel production at the Pueblo plant of the Colorado Fuel & Iron Corp.

■ **Lowell E. Hunt**, Tacoma, has been appointed Standard Oil Co. of California's regional manager for Western Washington and Alaska.

■ **Walter W. Kershaw**, Salt Lake City, has come out of retirement to become chairman of the board and chief executive officer of Lang Construction Equipment Co. in a reorganization of the firm.

■ **R. Porter Fay** has joined General Controls Co. as an Industrial Controls Div. field representative in the firm's Los Angeles sales office in Glendale.

■ **Kenneth G. Farrar** is new vice president in charge of manufacturing for the Douglas Aircraft Co.

■ **George R. Bellue** has been named sales representative of Borden Chemical Co.'s consumer products department. He will headquarter in Redlands, Calif.

■ **William F. Boyle** has joined the corporate staff of General Metals Corp., Transamerica's industrial subsidiary. He will be on special assignments in the San Francisco Bay area.

■ **W. J. Drummy** is new manager of engineering and sales for Adel Precision Products, Burbank, Calif.

■ **Charles W. Clarke** has been appointed manager of manufacturing for the Garrett Corp.'s AiResearch Industrial Div., Los Angeles.

■ **William R. Kimball, Jr.**, president of Kimball Mfg. Co., San Rafael, Calif., has been elected to the board of Utah Construction & Mining Co.

■ **Robert D. Conroy**, manager of the Denver district sales office of Gate City Steel Co., has been elected vice president of Empire Steel Corp.

■ **Mont G. Kenny** has been named controller and administrative manager of the Salt Lake City plant of Litton Industries, Electron Tube Div.

■ **Paul S. Rattle, Jr.**, Salt Lake City, has been appointed assistant to the manager of marketing for the American Gilsonite Co.

■ **R. K. Frederick** has been named manager of the American Can Co.'s plant in Salem, Ore.

■ **Kenneth R. Geiser**, **Dr. Robert R. Johnson** and **Dr. Helmut M. Sassenfeld** have been named to three top managerial posts at General Electric Co.'s computer department at Phoenix.

■ **J. Bruce Clyne** is new vice president of manufacturing, Stanley Aviation Corp., Denver.

■ **Donald M. Hatch, Jr.**, has been elected a vice president of both Dumont Mfg. Corp. and its parent firm, Dutron Corp., both of San Rafael, Calif.

■ **William F. Morrow**, formerly general sales manager of Pioneer Aluminum Inc., has been named vice-president in charge of sales.

■ **Robert G. Milliken**, formerly with Polson Implement Co., a Deming Co. distributor in the Northwest, has joined the Deming sales staff for that area.

■ **George F. Clifford** is the new manager of the Spinco Div. of Beckman Instruments, Inc., Palo Alto, Calif.

■ **Calvin L. Dickinson** has been named director of manufacturing for American Potash & Chemical Corp. plants at Trona, Calif. and Henderson, Nev.

■ **Thomas R. Penberthy**, formerly with Lamson Corp., has joined Rapistan of California, Inc., as manager of operations.

■ **R. L. Sutherland** is new plant superintendent of the Kelman Power Circuit Breaker Div., Los Angeles, of I-T-E Circuit Breaker Co.



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■ **James A. McBride** has been appointed to the new position of vice president-finance of Monogram Precision Industries, Inc., Culver City, Calif.

■ **Robert N. Carson, A. Richard Hammer** and **Paul E. Pazurek** are newly appointed project engineers in the Inet Engineering Dept. of Leach Corp.

■ **Jennings David**, Pasadena, Calif., is newly named vice president, engineering, Summers Gyroscope Co.

■ **R. G. Lowry** has been appointed manager of Fruehauf Trailer Co.'s Fresno branch.

■ **Dr. Murray Bloom** has joined Pacific Semiconductors Inc., Culver City, Calif. He will conduct research in organic chemistry.

■ **Walter P. O'Farrell**, San Francisco, has been elected a member of the board of directors of J. H. Pomeroy & Co., Inc.

■ **Norman L. Weiss**, Salt Lake City, milling engineer, American Smelting & Refining Co., has been named by the American Institute of Mining, Metallurgical, and Petroleum Engineers to receive its Robert H. Richards Award.

■ **Francis K. McCune**, internationally known for his work in atomic energy, has been appointed vice president engineering services for the General Electric Co.

■ **Miles J. Turpin** has been named sales promotion supervisor for the Tidewater Oil Co.'s Western division.

■ **W. H. Atkinson** has been named marketing manager of International Rectifier Corp., El Segundo, Calif.

■ **George Anisman** is new research and product planning manager of Telecomputing Corp.'s Whittaker Controls Div.

■ **James I. Banash**, consulting engineer for the Linde Co., Div. of Union Carbide Corp., died January 10, 1960 in Los Angeles.

■ **Col. Richard G. Thomas**, USA, Ret., has been appointed a technical specialist for Aerojet-General Corp.'s long range planning division at Monterey, Calif.

■ **Frank W. Taylor**, Denver, has been named a sales agent for the tubular products division of the Babcock & Wilcox Co.

■ **John J. Guarrera** has been named head of the instrument division and **Walter J. Mikos**, head of the M-D-I division of Burton Mfg. Co. at Santa Monica, Calif.

■ **Woodrow W. Lair** is new refinery superintendent at the U. S. Borax & Chemical Corp.'s potash operations at Carlsbad, N. M.

■ **Joseph F. Canevaro** has been promoted to the position of paint plant superintendent for the Pacific division of DeSoto Chemical Coatings, Inc., Berkeley, Calif.

■ **Edward J. Sohn** has been appointed vice president and general manager of Yuba-Bedford Corp., a subsidiary of Yuba Consolidated Industries, Inc.

■ **Jackson L. Garner** has been named vice president in charge of the Siegler Corp.'s Holly-General Div. San Diego, Calif. district sales office.

■ **Steig Gavelin** is newly named manager of market planning and analysis, product planning, at Aeronutronic, a division of Ford Motor Co., at Newport Beach, Calif.

■ **Earl Q. Bowers** and **Richard J. Dempsey** have joined the National Cash Register Co., electronic division, Hawthorne, Calif., as design development engineers.

■ **Carroll C. Petersen** has been named Western district construction manager for the American bridge division of U. S. Steel Corp. at San Francisco

■ **William P. Rogers**, Los Angeles, has been appointed manager of Howard Supply Co.'s enlarged petroleum marketing equipment division.

■ **Robert Patterson** is the new sales manager for the Pacific Coast facility of Airtron, Inc., in Los Angeles, a division of Litton Industries.

■ **Charles L. Baker** has been named general manager of Baker Steel & Tube Co. He succeeds **J. Perc Boore**, who has retired after 19 years with the Los Angeles firm. **Harry E. Byerrum** is new Los Angeles district manager.

■ **Quinn Gow** is newly appointed chief thermal engineer for the Zippertubing Co., Los Angeles.

■ **Charles L. Lippman**, San Mateo, Calif., is newly elected president of the national Society of Packaging and Handling Engineers.

... for more details, circle No. 68

Contract News in the West

LOS ANGELES—Over \$5½ million in contracts was awarded by the U. S. Army Ordnance District in Los Angeles during December. Largest contracts went to *Sperry Rand Corp.*, Salt Lake City, \$2,491,645 for guided missile research and development work, and \$414,000 for Sergeant missile repair parts.

Douglas Aircraft Co., Inc., Santa Monica, contracts in the amount of \$1,445,107 for Nike missile repair parts and launching area items. The *Firestone Tire & Rubber Co.*, Los Angeles, a \$524,793 contract for engineering services relating to the Corporal missile and ground handling equipment.

North American Aviation, Inc., Rocketdyne Div., Canoga Park, classified contracts in the amount of \$108,500, and a \$49,690 contract to the Missile Div., Downey, for research and development work relating to the Saturn booster.

California Institute of Technology, Pasadena, a \$135,000 contract for research and development work on the Sergeant missile program. *Associated Aero Science Labs, Inc.*, Hawthorne, contracts in the amount of \$128,893 for technical services. *Norris-Thermador Corp.*, Vernon, a \$120,168 contract for booster rocket motors. *Gillilan Brothers, Inc.*, Los Angeles, a \$109,942 contract for Corporal missile repair parts. *Harvey Aluminum*, Torrance, a \$59,812 contract for production engineering study, and a \$31,664 research and development contract.

AiResearch Mfg. Co., Los Angeles, a \$63,284 contract for Nike missile repair parts. *U. S. Flare Div.*, Saugus, a \$50,931 research and development contract for development of illuminating shells. *Statham Instruments, Inc.*, Los Angeles, a \$35,828 contract for signal amplifiers. *Collins Radio Co.*, Burbank, a \$28,059 contract for mechanical carrier selector filters. *U. S. Chemical Milling Corp.*, Manhattan Beach, a \$26,641 contract for bulkheads.

Among San Francisco Ordnance District contracts reported for December: *Pacific Tire & Rubber Co.*, Oak-

land, \$294,644 for truck and vehicle tires; *Food Machinery & Chemical Corp.*, San Jose, installation of two compression ignition engines in M113 personnel carriers, \$76,866; *Kaiser Steel*, sheet metal, for \$30,916 and *Western Gear Corp.*, Seattle, \$20,711 for transfer, transmission assembly.

Underwood Testman Co., Albuquerque, was apparent low bidder for construction of four gate houses, seven storage igloos, and modifications to two buildings at Sandia Labs, which is operated for the AEC by Sandia Corp. The firm bid \$226,614.20.

AEC announced award of an architect-engineer contract to *Hummel, Hummel & Jones, Boise*, to design a MTR-ETR storage and receiving building to serve the two large testing reactors at the National Reactor Testing Station, Idaho. Estimated cost range of the building construction is \$300,000.

The Los Angeles Division of *Servo-mechanisms, Inc.*, received an order from *Hughes Aircraft Co.* of the production of air data computer test sets in the amount of \$741,000.

Pneumatic Equipment Firm Expansion

ENGLEWOOD, COLO.—The C. A. Norgren Co. here will expand into the Littleton plant now occupied by the Norgren-Stemac division, according to C. Neil Norgren, executive vice president.

Under present plans, Norgren-Stemac, producer of die-castings and plastic moldings, will become an integrated part of the parent company. Norgren-Stemac's name-plate portion of its business has been sold to the Douglas Co. of Minneapolis.

The move, officials said, was made necessary by the growth of the Englewood manufacturer of pneumatic equipment.

Alcoa Restarts Idle Potline

WENATCHEE, WASH.—A potline at Alcoa's smelting works here will be reopened this month, according to W. N. Farquhar, works manager. The line was suspended at the smelting works early in 1958 when there was lessened demand for primary metal. Approximately 75 employees will be recalled.

Arwood Precision Merges With Two Castings Firms

LA VERNE, CALIF.—The Arwood Precision Casting Corp. merged with the Mercast Mfg. Corp. and the Alloy Precision Castings Co. early in January, 1960. The newly formed company will be known as the Arwood Corp.

The facility here will operate as the Mercast Div. of the Arwood Corp. and will specialize in the larger type castings produced by their patented mercury process and newly perfected shell process.

The firm's expanded East Los Angeles plant will continue to service its Western division customers with small and intermediate size castings.

MHD Research Western Rep for Thermal Dynamic

NEWPORT BEACH, CALIF.—With sales headquarters here, MHD Research, Inc. has been appointed sales representative for the States of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Oregon, Texas, Utah, Washington and Wyoming by the Thermal Dynamic Products Div. of the Waltham Precision Instrument Co.

MHD specializes in the area of magnetohydrodynamics: plasma and ion physics, high temperature and energy conversion.

Leslie E. Olsen Co. Named RCA Rep for Montana

LEWISTON, MONT.—Newly appointed RCA representative for Montana, the Leslie E. Olsen Co. will handle two-way radio equipment, including the firm's new transistorized mobile unit for use by transportation companies, public utilities, trucking firms and public safety departments.

CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are 1/8 inch short of contracted space to allow for borders and composition. Rates are \$16.00 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 25th if no proofs are required.

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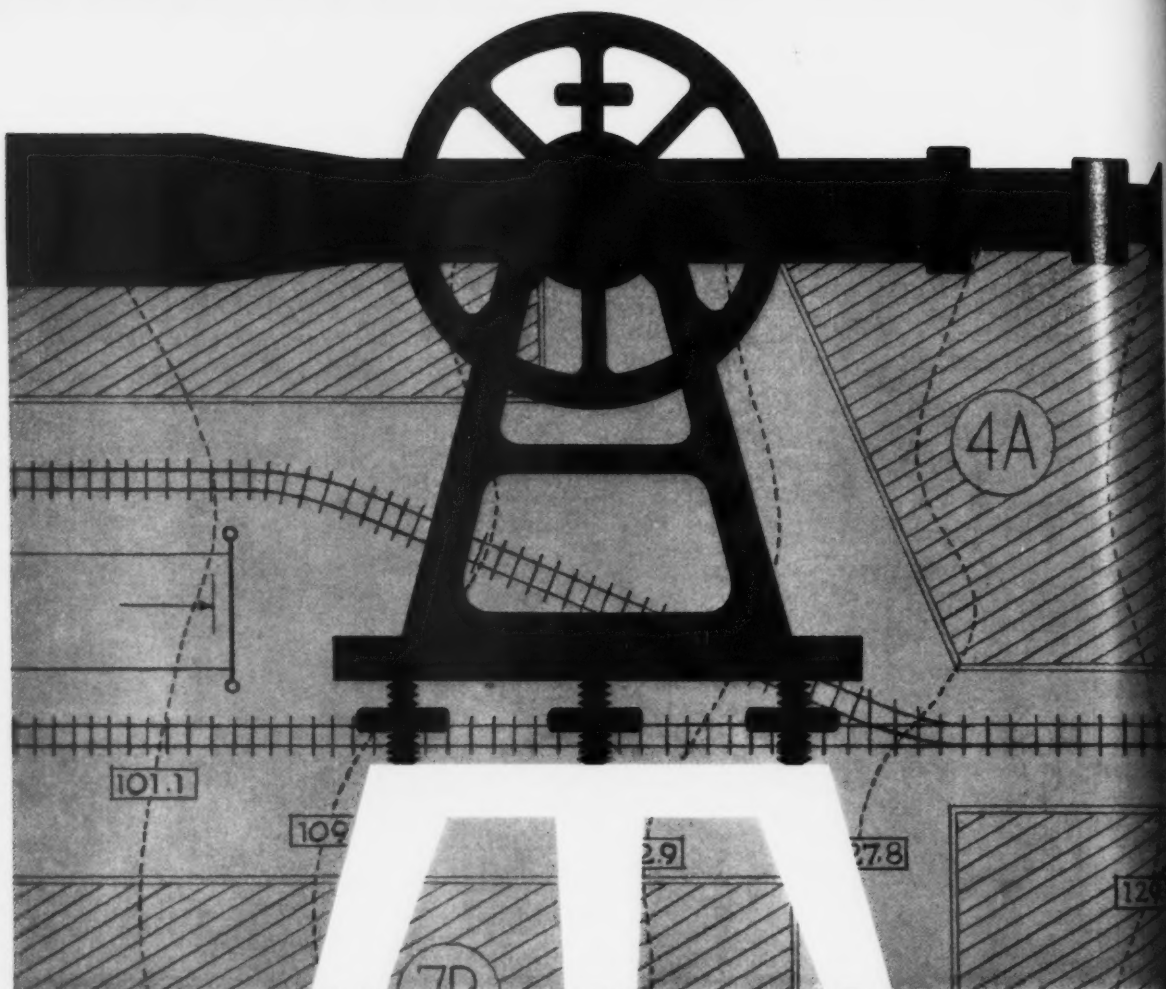
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